# AN ESSAY ON THE Animal Oeconomy.

TOGETHER WITH

# OBSERVATIONS UPON THE SMALL POX.

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*Tranſlated from the* FRENCH.

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# PREFACE.

H*E who undertakes the Profeſſion of any* Art, *without a thorow Knowledge of its* Rules and Principles, *muſt expoſe himſelf to all the Diſgrace that is due to the Commiſſion of Faults equally groſs and numerous. And he, who neglects to beſtow a cloſe Attention upon the Experiments which his Practice may furniſh him with, renounces the moſt natural Way of* Improvement *in his Art, and even runs the Hazard of deviating in Time from the* Rules *themſelves. Not that theſe are ſo uncertain and fallacious, as that they can, in any Manner, contribute to our Errors. Their Certainty is moſt firmly eſtabliſhed; for they are founded on* Experience. *But how was it poſſible, that They, who firſt preſcribed and reduced them into Method, ſhould foreſee the infinite Applications, and almoſt numberleſs Exceptions, which theſe Rules are capable of, and liable to? The Mind of Man is too weak for this; its Proſpects too ſhort and too confined. Various Occaſions preſent themſelves, wherein we are obliged to bend theſe Rules, to enlarge their Senſe and Meaning. They are, ſurely, moſt excellent Guides in common beaten Paths; and whenever we ſtrike out of theſe, we do not annull, but confirm their Authority. The Sciences founded on theſe General Principles, are, by this Means, improved and perfected; their Territories are extended, and made more fruitful. Theſe are the Advantages which they derive from the conſtant Obſervations of thoſe who cultivate them.*

*This we find from every Day's Experience, particularly with regard to ſuch Obſervations as have* NATURE *herſelf for their Object; that* Nature, *ſo various in her Productions, ſo ſecret in all her Operations. The more cloſely we purſue, the more eagerly we court her; the more yielding and familiar doth ſhe become. It is Folly to expect, that ſhe will comply upon every ſlight and weak Solicitation; ſhe muſt be preſſed, and importuned, and followed into her moſt hidden Receſſes; and even there moſt commonly ſhe will but unveil*

*veil by halves: The Favours already won, are not inconſiderable, but ſhe hath ſtill far more in Reſerve. Whoever, therefore, aſpires to an Intimacy with her, is obliged to an unwearied Attendance upon all her Steps and Motions. Without this Aſſiduity, there is no Succeſs or Reputation to be hoped for.*

*Thoroughly convinced of this great Truth, when we entred upon the Practice of Phyſick, we thought it not enough to be acquainted with the Fundamental Principles of that Science. We judged it neceſſary to advance them ſtill farther, and to collect new ones every Day, by the Help of accurate and conſtant Obſervations, not only in* Anatomy, *but alſo in the* Materia Medica, *and the* Nature of Diſeaſes. *That our Inquiries might become the more uſeful, we conceived, that, after having directed them according to the beſt* Natural Philoſophy, *we ought to connect and methodize the Concluſions reſulting from them, ſo as to form an happy Union betwixt* Theory *and* Practice. *For, indeed, to what Purpoſe are looſe Speculations in Phyſick, which terminate in nothing that is Real and Senſible? What Fruit is to be gathered from a long Train of Experiments, without Method, and without a fixed Object?*

*To qualify ourſelves for ſucceſsful Practice, we are obliged to begin with the Study of the*

ANIMAL OECONOMY, *and to have recourſe to Treatiſes of* Anatomy, *in order to lay our Foundation; but then no compleat Knowledge is to be derived from theſe alone: Frequent Diſſections muſt furniſh us with that. After we have carefully examined the Organization of the Human Body, and diſcovered the Situation, Structure, and Uſes of its Parts; our next Step is, and that but a Short one, to the Nature of the Diſeaſes which invade them; and which, indeed, are nothing elſe but a Diſorder in their Natural Functions. But ſtill this is not enough; our Reſearches muſt not ſtop here.*

*The Sole End of Phyſick is, to cure theſe Diſeaſes by the Help of Medicines, able to correct the vitiated* Fluids, *and to free the* Solids *when oppreſſed. Now how is it poſſible to make a ſure and right Application of theſe, without diſtinguiſhing their ſeveral Qualities, their different Manners of Operation, and the juſt Proportions of their Mixture? Here then do Treatiſes of* Botany, Chymiſtry *and* Pharmacy *take Place; the uſual Sources from whence we draw our Inſtruction; but yet we muſt not confine ourſelves to theſe. To confirm and ſupport the Doctrines they contain, or to diſcover the Errors there, we muſt ourſelves inquire into the Natures of Plants, Seeds, Fruits, Gums, Metals, Minerals,* &c. *and into the Compo-*

*ſition of the Medicines, of which theſe are the Ingredients.*

*By the Help of theſe ſeveral Parts of Knowledge, a Man may become a good* Obſerver *in Phyſick; yet ſtill he will not merit the Title of a good* Phyſician, *'till after a long Train of Obſervations, and a regular laborious Practice.*

*Let it be our Principal Care to trace out the Firſt Cauſes of each Diſeaſe; and to diſtinguiſh the ſeveral Accidents that may attend it: Let us exactly remark its Symptoms, its Progreſs, its Variations, and Event: Let us be intent upon the Operations of our Medicines, and endeavour to reduce them to ſome certain Standard, by obſerving their different Effects in different Circumſtances. In all Intricate and Dubious Caſes, let us conſult the moſt celebrated Authors, and thoſe who practiſe with the beſt Reputation: Let us make Advantage of their Notions, and accuſtom ourſelves to weigh and digeſt them; to convert them (if I may ſo ſpeak) into our own proper Nouriſhment, when we have improved and rectified them, as there ſhall be Occaſion, by our own well-grounded Principles. This, in conjunction with ſome Sagacity and Penetration, will guide us to as ſure* Prognoſtics, *as the Nature of our Subject will admit: This Conduct, together with a large Stock of Pru-*

*Prudence, and a larger one of Probity, will form ſuch a Phyſician as may be able to diſcharge the Duties of his Profeſſion.*

*The Method here chalked out for thoſe who dedicate themſelves to this Study, ſeems to me a great deal more certain, than that which commonly prevails. And yet I dare not hope it will be approved by all who profeſs the Art of Phyſick. That* Syſtematick *Air, which it carries along with it, is likely enough to diſguſt all thoſe, who value themſelves upon enduring nothing like a* Syſtem *in Phyſick. Permit me, therefore, to explain what I mean by ſuch a* Syſtem, *and to try, whether, by cutting off all Diſputes about Words, our Differences may not be reconciled.*

*A Heap of mere Conjectures, how ingenious ſoever, can never merit that Title. 'Tis only due to a* Collection, to a Concatenation of many undoubted Obſervations and Experiments, having a mutual Relation to each other, and derived from the Structure of the Human Body; from the ſeveral Diſeaſes that obſtruct and diſorder the Natural Functions; and from the Effects of the Medicines uſed to reeſtabliſh them.

*This is preciſely what I underſtand by a* Syſtem of Phyſick; *and will any One diſpute the*

*the Uſefulneſs and Neceſſity of it? Can this be confounded with the* Hypotheſes *which have more Fancy than Judgment in them; the abortive Offspring of a lively, fruitful Genius, unaſſiſted by Study or Obſervation? Prejudice itſelf cannot paſs ſo unjuſt a Sentence.*

*All Arts, even the moſt illiberal and mean, are guided by their peculiar Rules and Principles. And ſhall* PHYSICK *alone, that Profeſſion, to whoſe Charge the moſt precious* Depoſitum, *the* LIFE *of* MAN, *is committed! ſhall* It *obey the Conduct of mere Chance, and give the Reins to Hazard! Or can we have a more faithful Guide than a* Syſtem, *or (if there's any Thing ſhocking in that Term) ſuch a* Method *as we have here propoſed? Muſt we needs ſuffer ourſelves to be hurried in the Dark, from Uncertainty to Uncertainty? Should we not rather purſue that Rout, which conſtant Experience points out, reſerving ſtill a Liberty of deviating from it, in ſome Meaſure, when extraordinary Occaſions ſhall ſo require?*

Make your OBSERVATIONS, *ſay they*, that is the eſſential Buſineſs of a Phyſician. *We are far from diſputing it: but muſt we only obſerve confuſedly, without being directed by fundamental, preliminary No-*

*Notions? ſuch Obſervations (I'm afraid) will ſcarce reward the Pains of making them: For, unleſs we trace them back to the Principles from whence they naturally flow, they will be, for the moſt Part, but of little Benefit in Practice.*

*The* Obſervations *of thoſe Authors, who have gone before us, ought to be carry'd up to the ſame Source. Some have affected to ſcatter them here and there in their Works, where they ſtand alone, independent on any* Syſtem, *and without Relation to any* Theory. *Others, in their Hiſtories of what occurr'd in Practice, have neglected a due Application of the Facts to thoſe Maxims, which they ſeem to have purſued in their Methods of Cure. And others again ſeem to have publiſh'd their Obſervations, with no other View, than to ſupport an ill-grounded* Hypotheſis, *which they had too lightly taken up.*

*What Uſe can the Writings of ſuch Authors be to us; unleſs we are at the Pains to unravel their Deſigns, and to remark every Thing that is ſingular, either in the Turn of their Minds, in their Practice, or Opinions? How ſhall we know what Streſs to lay upon their Doctrines; to diſtinguiſh Truth from Error, Certainty from Uncertainty; if we have not ſome ſettled Principles, for a Standard*

*Standard to weigh thoſe Doctrines by, and fix their Price.*

*We muſt, therefore, ſubmit, in every Branch of Phyſick, to* Syſtem *and* Method; *which alone can ſhew us the ſafeſt Path to tread in, guide us Step by Step along it, and prevent the Starts and Eſcapes which might throw us out of it.* Method *ought to preſide not only in our own Obſervations, but alſo in thoſe we collect from others. To this methodical Diſpoſition of our Inquiries, you may, if you pleaſe, refuſe the Title of* Syſtem, *and give it any other, which you judge more proper: I do not inſiſt upon it; Let but the* Thing *ſubſiſt, and the* Name *ſhall give me no Pain.*

*In the Diſputes rais'd on this Subject, it is very ſurpriſing to find ſome, who are the moſt earneſt in them, ſhake off the general Yoak of Rule and Order, only that they may impoſe upon themſelves another Ten times more grievous. However, they do not ſeem to feel its Weight, becauſe 'tis of their own making. Full of certain peculiar Notions, how do they labour, in their Practice, and Writings, to inculcate, and eſtabliſh them into a kind of* Syſtem; *while they condemn, without Pity or Remorſe, every Thing that looks that Way in others?*

'Tis in vain, *ſay they*, to propoſe Syſtems in Phyſick: There are none but what are defective. How can we avoid being miſled, when we are directed by them?

*We confeſs, there are none Perfect, even in our own Senſe. To form a compleat* Syſtem, *we very well know, that a prodigious Number of Obſervations and Experiments muſt be collected, and all the Womb of* Nature *explored. Now her Depths are infinite and unfathomable: How ſhall we penetrate all her dark Retreats, and range throughout this vaſt Abyſs!*

*And yet, all that can be fairly inferred from this Confeſſion, amounts to no more, than that among the ſeveral Parts which compoſe a Syſtem founded upon clear Facts, there will be ſome that ſtill remain obſcure, and want to be illuſtrated. But then, ſurely, theſe will receive ſome Light, from thoſe with which they are connected. At leaſt, we may reaſon conſiſtently, and draw ſome probable Concluſions, from the one to the other. Does the accidental Imperfection of ſome Parts of the Building, authorize us to ruin the Whole? Its Regularity is not compleat; yet ſtill 'tis much preferable to the Wildneſs and Deformity which ſome would introduce.*

*Far from running into theſe Extremes, we ſhall endeavour to make a good Uſe of the Difficulties themſelves, which retard the Erection of a compleat* Syſtem. *Theſe will ſerve to put us upon our Guard againſt the Illuſions, that are ſo apt to riſe, when all goes Fair and Eaſy with us. Theſe will oblige us to diſtinguiſh carefully, betwixt what is Certain and Demonſtrable, and what is Probable only; and betwixt Probability, and mere Conjecture. Theſe, in ſhort, will urge and animate us to inceſſant Labour, in order to fill up the Chaſms of our Fabrick, and to give it its compleat Strength and Beauty.*

*Let us, therefore,* Obſerve, *without Intermiſſion, in the Viſits we make to our Patients, and in thoſe Intervals of Study and Retirement, which the Duties of our Profeſſion allow us. But let us never* Obſerve, *but with Art and Method; with a ſtrict Eye to thoſe immutable Laws, by which Nature has regulated the Mechaniſm of the Human Body.*

*This Conduct hath produced, and theſe Maxims directed, our* Obſervations *upon the* Small-Pox. *They were originally intended for my own private Uſe only, and I had no other View in Publiſhing them, than to render them more perfect, by ſubmitting them to the Cenſure of the Learned in our Profeſſion.*

*feſſion. I might have ſtopp'd here, had I not thought it neceſſary, to the End that Phyſicians might make a better Judgment concerning them, to give an Account of the Speculations in* Anatomy, *by which I was guided in my Prognoſtics and Method of Cure. This is what engaged me to prefix an* Eſſay on the Animal Oeconomy: *which ought to be regarded as the* Point of Sight *to which all our Obſervations are referred. And here, I think, I may juſtly reſt, 'till ſuch Time as new Diſcoveries have placed this moſt difficult Structure in a clearer Light.*

*As to what remains; It is not neceſſary my* Preface *ſhould contain a ſummary Account of theſe two Treatiſes upon the* ANIMAL OECONOMY *and the* SMALL-POX; *which may be followed by the like concerning other Diſtempers. A* Synopſis *of theſe will be found in the Marginal Notes, which accompany the Text. Beſides the Order and Diſpoſition of the Treatiſes themſelves, will, I believe, ſupply the Want of an Extract. I have carefully avoided all unneceſſary Excurſions from my Subject, which commonly ſerve only for an Oſtentation of Learning miſplaced. I have not ſo much as aimed at Shining in the Ornaments of Speech rather gay and florid, than expreſſive; or in Turns of Fancy, more* *proper to dazle, than inſtruct; but have applied myſelf wholly to Order, Exactneſs, and Perſpicuity. This chaſte Simplicity is neceſſary in every* Didactic *Work; where we are oblig'd to be intelligible, even to thoſe who have but a ſlight Tincture of the difficult abſtracted Subjects there treated of.*

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# AN
# ESSAY
# ON THE
# *ANIMAL ŒCONOMY.*

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## *General* DIVISION *of* DISEASES.

**Two principal Kinds of Diſeaſes.**

ALL the Diſeaſes, which afflict Mankind, are commonly ranked under Two Heads.

**Acute Diſeaſes.**

Some are called *Acute*, becauſe they are quickly over, and ſometimes terminate the Third or Fifth Day; though they may continue to the Fortieth.

**Chronical.**

Others are called *Chronical*, inaſmuch as they may laſt ſeveral Months, nay, Years.

Principal Symptoms in Acute Diſeaſes.

*Acute Diſeaſes* are always attended with an acute continued Fever, and with ſeveral Symptoms; among which the Inflammation of the *Viſcera* is moſt to be apprehended.

Ordinary Symptoms in Chronical Diſeaſes.

In *Chronical* Diſeaſes only a ſlight Feveriſh Diſorder is commonly felt, which increaſes towards Night, and is called a *Slow-Fever*. The moſt ordinary Cauſe of theſe Diſeaſes, is, A Stoppage, or Obſtruction in the Glands of ſome of the *Viſcera*.

The Knowledge of the Cauſes of theſe Symptoms neceſſary to the Cure.

Hence we may eaſily judge how neceſſary it is, before we undertake the Cure of Acute and Chronical Diſeaſes, to furniſh ourſelves with a clear and diſtinct Knowledge of the Cauſes of a Fever, of an Inflammation, and Obſtruction in the Glands. To attain this, there are ſeveral Things to be attended to.

Objects to be conſidered, in order to know theſe Cauſes.

Structure of the Veſſels.

The *Structure* of the Veſſels, through which the Juices flow, and of the Glands, which ſerve as Strainers to them.

Mechaniſm of the Circulation of the Fluids.

The *Mechaniſm*, by which the Juices circulate in all the Parts of the Body.

The ſeveral *Motions* impreſſed upon them.

And laſtly, The *Cauſe* which obliges certain Juices to filtrate conſtantly thro' the ſame Glands.

The Human Body is compoſed of Two Kinds of Parts; the *Solids*, and *Fluids*.

## *Of the* SOLIDS *and* VESSELS.

**The Solids.**

**Veſſels.**

ALL the Solid Parts contain ſome Fluid within them; they may therefore be looked upon as ſo many Veſſels. Nevertheleſs we ſhall give that Name to ſuch only as ſerve to the Circulation of the Blood and *Lympha*; and to thoſe which are appointed for the Filtration of certain Juices.

**Diviſion and Situation of the Veſſels.**

In general, we are to obſerve, That all the Veſſels, whether *Lymphæducts* or *Blood-Veſſels*; whether *Secretory* or *Excretory*, are ſituated between Membranes, or Membranous *Laminæ*.

**Blood-Veſſels, their Diſtinctions.**

The Veſſels, in which the Blood circulates, are divided into *Arteries* and *Veins*.

**Sanguinary Arteries.**

The *Sanguinary Arteries*, which are ſo many Pipes through which the Blood is conveyed to all the Parts, ariſe from the Left Ventricle of the Heart. They begin with an Arterial Trunk, called the *Aorta*; from whence conſiderable Branches ariſe, which are diſtributed into all the Parts of the Body. Afterwards they branch out, and are divided into a Multitude of very ſmall Arteries, which have the Name of *Capillary*, becauſe of their extreme Smallneſs. Theſe make an Infinity of Windings and Turnings throughout all the Parts. Being continued, and becoming ſtill more ſlender, they commonly form the *Capillary Veins*. Such is the Diſtribution, ſuch the Office of the Arteries; that of the Veins is different.

Sanguinary Veins.

The Capillary Blood-Veins empty themſelves into larger and more conſiderable Branches, diſcharging themſelves into the aſcending and deſcending Trunks of the *Vena Cava*, which terminate at the Right Auricle of the Heart. Thence the Blood paſſes into the Right Ventricle, and is thrown into the *Pulmonary Artery*, which diſtributes its Branches throughout the Lungs. It returns by the *Pulmonary-Veins*, deſcends into the Left Auricle and Ventricle, and thence returns into the *Aorta*, and is conveyed, in the forementioned Manner and Order, throughout the Body.

Lymphatic-Veſſels.

The Veſſels appointed for the Circulation of the *Lympha*, may likewiſe be divided into Arteries and Veins.

Lymphatic-Arteries.

We call thoſe *Lymphatic Arteries*, which ariſe from the *Plexus's* of the Capillary

Blood-Veſſels, and convey the *Lympha* to all the Parts.

Lymphatic-Veins.

Thoſe are called *Lymphatic-Veins*, which bring the *Lympha* back again into the Sanguinary-Veins.

But the Compariſon between the Lymphatick and Blood-Veſſels, cannot be made ſo exact as were to be wiſhed, for the following Reaſon:

Difference between the Sanguinary-Veins and Arteries.

The Sanguinary Arteries do from their Structure derive a ſuperior Force, and more conſiderable Motion, than what the Veins are endowed with: In this their Difference conſiſts. On the contrary, the Lymphatic-Arteries appear deſtitute of Motion, as well as the Lymphatic-Veins, and no Difference hath, as yet, been obſerved, with Reſpect to the Structure and Force of theſe Two Sorts of Veſſels, containing the *Lympha*. Nevertheleſs, being to give an exact Deſcription of the Animal Oeconomy, we have found it neceſſary to diſtinguiſh theſe Veſſels into Veins and Arteries, in regard to their diſtinct Offices. We ſhall therefore obſerve this Diviſion eſtabliſhed by ſome Anatomiſts, tho' neglected and over-looked by many others, and eſpecially by moſt Phyſicians.

No apparent Difference between the Lymphatic-Arteries and Veins.

Secretory and Excretory-Veſſels.

A Third Claſs of Veſſels, is that which comprehends thoſe whoſe Office is to ſeparate the Juices, and diſtribute them to the ſeveral Parts.

Secretory.

We call thoſe *Secretory Veſſels*, whoſe Uſe is to ſeparate one particular Fluid from the reſt.

Excretory.

Thoſe which we call *Excretory*, are either the Extremities of the laſt-mentioned, or other Veſſels which empty the Fluid, ſo ſeparated, into ſome Part.

Particular Obſervations upon the Structure and Elaſticity of the Veſſels in general.

All theſe Veſſels muſt have their Exiſtence from the Moment the Body is formed *in Ovo*. Their Structure is ſuch, as that they have always a Tendency to cloſe and contract. We ſee their Diameters grow leſs in living Subjects, according as the Fluid that circulates in them, takes up more or leſs Room, either on Account of the Diminution of its Quantity, or of its Rarefaction. When the Fluids circulate no longer through ſome Veſſels, they cloſe up, and their Sides grow together, ſo as to leave no Cavity.

In like Manner, we find them conſiderably ſhrunk up after Death, when we come to diſſect.

# *Of the* FLUIDS, *and their* MOTION.

The Fluids form'd and contained in the Blood.

Their Mixture what is call'd Blood.

AS to the ſeveral Fluids of our Body, they are form'd in the Blood; there are they all contain'd, and circulate in one mix'd Maſs through the Blood-Veſſels. To this Mixture of all the Fluids contain'd in the Veſſels, we give the general Name of *Blood*.

## *Its* MOTION *is Threefold.*

Threefold Motion of the Blood.

*A Motion of Fluidity*, or, that Inteſtine Motion of its Parts, which it has in common with other Fluids.

*A Protruſive Motion*, by which it is puſh'd and carried around from the Heart to the Parts, and back again from the Parts to the Heart.

*A Fermentative Motion*, throughout its whole Maſs, agitating all its Parts, forming and producing the various Humours of which it conſiſts, and giving Warmth to all the Solid Parts.

Cauſe of the Motion of *Fluidity*.

'Tis certain, the Motion of the Air is not the Principle of the Blood's Fluidity; differing in this reſpect from other Fluids, it ceaſes to be ſuch, when it is expoſed to Air. It owes this Quality to nothing elſe but the conſtant Motion of the Solids, thro' which it circulates, and the fermentative Motion within itſelf; as is eaſily proved: For its Fluidity may be a good while preſerved, by ſtirring and keeping it in a gentle Heat, as in your Hands, or in the Steam of warm Water, &c. On the contrary, it quickly loſes it by being expoſed without Motion to the Air, whoſe Impreſſion, according as it is more or leſs cold, coagulates it with the greater or leſs ſpeed.

Cauſe of the Protruſive Motion.

As to the *Protruſive Motion*, by which the Blood is carried to, and brought back from all the Parts; that is produced by two Cauſes; namely, The Motion of the Heart, and of the other Solids.

That we may more eaſily comprehend this *Mechaniſm*, we are to conceive the Two Cavities of the Heart, and all the other Veſſels, full of Fluids. When the Heart contracts, it impels a certain Quantity of the contain'd Fluid into the Arteries, by which they are forc'd to dilate. Now the Structure of theſe Veſſels is ſuch, that their Sides have a Natural Tendency to approach each other, Conſequently, upon every Dilatation, the Elaſtic Fibres, which compoſe theſe Veſſels, muſt re act with their Spring upon the Blood, and ſo impel it forwards into the ſeveral Parts.

Cauſe of the Fermentative Motion.

The Cauſe of the Third Motion, that Inteſtine Tumultuous One, to which we have given the Name of *Fermentative*, may be eaſily diſcern'd. Fluids of certain different Qualities cannot come together and mix, but a Fermentation muſt ariſe. The Blood, which is a Compoſition of various Fluids, contains ſeveral, very capable of fermenting when their Particles meet, which cannot fail of happening becauſe of the violent Agitation of all its Parts; of Neceſſity therefore it muſt have a *Fermentative Motion*.

Arguments for a Fermentation in the Blood.

In vain have ſeveral Phyſicians denied this: Nothing is more evidently made out. The Heat which belongs to it, and which it communicates to all the Parts; the Formation of the *Bile*, *Saliva*, and other Humours within it; its Rarefaction, which is ſenſibly increas'd, either by the ſole Influence of a warm Air, or by a Variety of other Cauſes: Theſe ſeveral *Phænomena* cannot be aſcribed, either to the bare *Motion of Fluidity*, to the *Protruſive Motion*, or to the Motion of the Solids. They can only riſe from a different Motion excited among the Particles of the Liquor itſelf; Call it *Efferveſcence*, *Ebullition*, or what elſe you pleaſe, we ſhall call it *Fermentation*; For, the narrow Limits preſcribed to this

Work, will not permit us to enter into nice Diſtinctions.

Different Colours of the Blood in the Veſſels.

The Blood appears of two Colours ſomewhat different from each other, in its Veſſels. 'Tis of a *bright lively Red* in the Pulmonary Veins, in the left Auricle and Ventricle, and in the Arteries. It appears of a *deep blackiſh Red* in the Veins, in the right Auricle and Ventricle of the Heart, and in the Pulmonary Arteries.

By a Variety of Arguments, contain'd in a Paper which I preſented to the *Royal Academy of Sciences*, in the Year 1718, I believe I have proved its *deep Red* to be owing to its greater Rarefaction in the Veins; and that, on the contrary, it acquires a *lively bright Red* from its Rarefaction being leſſen'd in the Pulmonary Veins by the Air's Entrance into the Lungs: An Effect which the Air produces, either from its being colder than the Blood, or by ſome of its Particles penetrating into the Veſſels, and mixing with that Fluid.

Different Fluidity of the Arterial and Venal Blood.

The *Arterial* Blood differs likewiſe from the *Venal*, in that it is more Fluid; which ariſes from its Particles having then a leſs Coheſion with each other, notwithſtanding its leſs rarefied State; in the ſame Manner that Soap diſſolv'd in Water, or Chocolate, when they are not lather'd, are more Fluid, than when they've been agitated and reduced to Froth.

Diviſion of the Blood into two Liquors of different Colour.

Red and Globulous Part.

It appears moreover to the bare Eye, that the Blood conſiſts of two Fluids very different from each other. The one is very red, and wholly compoſed of ſmall ſpherical Particles, pretty ſoft: this is the *Blood* properly ſo called.

Its Uſe.

We do not know exactly the real Uſe of theſe Globules; they are, perhaps, deſign'd to preſerve the Fluidity of the *Lympha*, or the Fermentation, it may be, of the Blood in general, that is, of all the Liquors it contains. A Conjecture which has the more probable Face, in that we don't obſerve any ſenſible Fermentation in the *Lympha*, unleſs when mix'd with theſe Globules. They ſeem compoſed of a very fine oily Part, and of a nitrous Salt. They are indeed naturally ſoft and oily; and when dried and thrown into the Fire, they make an Exploſion like Nitre.

Clear Part, or *Lympha*.

Various Juices in the *Lympha*.

The other Part of the Blood called *Lympha*, appears white, limpid, and conſiſting of ramous Particles. It may rarefy conſiderably; whereas the Globulous Part is hardly capable of Rarefaction. There is Reaſon to think the *Lympha* contains almoſt all the other Juices; For Inſtance, The *Succus Nutritius* of all the Solids,

lids, the *Bile*, the *Saliva*, the Juices ſeparated in the Glands of the Stomach, of the Inteſtines, and of the Womb, the *Succus Pancreaticus*, the *Urine*, &c. What ought to ſupport this Opinion, is, that the red Part of the Blood does not ſeem united or mixed with theſe Humours, of which it is hardly capable, by Reaſon of the globular Figure of its conſtituent Particles. Beſides, we do not find, that it undergoes any Alteration, when ſome of theſe Humours are vitiated.

Affected by the Alterations of thoſe Juices.

As to the *Lympha*, we are to obſerve, that its ramous Particles render it very fit to intangle the other Fluids, and to hold them within its Maſs. It ſeems to partake conſiderably of all the Alterations which befal them: in the ſame Manner that theſe different Fluids are eaſily affected by the Changes which others of them undergo. Thus, when the *Bile* is no longer ſeparated in the Glands of the Liver, the Urine becomes red, the *Saliva* bitter, the Parts contract a Yellowneſs, Nauſeatings and Vomitings ſucceed, &c. and, nevertheleſs, no ſenſible Alteration is obſerved in the red Part, or Blood properly ſo called.

Diſtribution of the *Lympha* in its Veſſels.

Finally, the *Lympha* is convey'd to all the Parts of the Body, by Veſſels, which we have nam'd *Lymphatic Arteries*. Afterterwards, it is brought back by the *Lymphatic* into the *Sanguinary Veins*, where it again mixes with the Blood and other Fluids.

## *Of* ACUTE DISEASES.

Alteration of the Blood, eſpecially in Acute Diſeaſes.

FROM the general *Idea* we have given of the Motions of the Blood, and *Lympha*, in their natural State, it will not be difficult to conceive the Alterations they are capable of. The quickeſt and moſt conſiderable of theſe, manifeſt themſelves chiefly in *Acute Diſeaſes*, of which we ſhall treat in the firſt Place.

Acute Diſeaſes never without a Continued Fever.

Along with theſe Diſeaſes, comes always a *continued Fever*, very acute, and often attended with an Inflammation. We are therefore obliged to begin with ſhewing what a *Fever*, what an *Inflammation* is, and whence theſe Accidents ariſe.

## *Of* Continued *and* Intermitting FEVERS.

Common Definitions of Diſeaſes too obſcure.

I Shall not detain the Reader with giving a formal Definition of a Fever. Moſt of the Definitions, which have hitherto been given of Diſeaſes, have been more obſcure than the Thing propoſed to be defined; I may therefore venture to aſſert, That they ought to be abſolutely thrown aſide, ſince they do not tend to give us clear *Ideas*: Would not it be better to ſubſtitute in their Place, an accurate Deſcription of all the Symptoms which characterize each particular Diſeaſe? 'Twould certainly be more proper to ſhew Students, and young Phyſicians themſelves, that a Man actually affected with ſuch and ſuch Symptoms, has certainly ſuch and ſuch a Diſeaſe.

Diſeaſes better deſcribed than defined.

According to this Method, let us ſet before us a Perſon in whom we find a præternatural Height and Quickneſs of Pulſe, and a more than ordinary Heat in his Skin. We ſhall have Reaſon to conclude, that he is attacked by a Fever; but not unleſs theſe Symptoms are accompanied with a Diſorder in the Natural Functions or Animal Oeconomy; For, we are to obſerve, that an Alteration in the Pulſe, and a burning Heat in the Skin, may be produced by external Cauſes, without the Intervention of a Fever; as we ſee happen from too violent Exerciſe, Hard Drinking, and ſuch like Exceſſes.

Deſcription of a Fever.

Cauſe of the Elevation of the Pulſe, and other Symptoms.

It will be eaſy to point out the Cauſe of the Elevation of the Pulſe, as well as of the other Symptoms, in a Fever, if we only recollect the Effects before aſcribed to the Fermentative Motion of the Blood. For it is that which produces the natural Heat of the Parts, and the Pulſation of the Arteries. So that when it ſhall happen, in a præternatural State of the Body, that the Parts become more hot, and the Arteries beat with greater Quickneſs and Violence; this Increaſe of Heat and Motion cannot reaſonably be imputed to any Thing but the Increaſe of Fermentation in the Blood.

Idea of a Fever.

Upon this Principle, a Fever ought to be conſider'd as nothing elſe but *a brisker and greater Fermentation in the Fluids*, increaſing all their natural Motions, exciting a greater Heat in all the Parts, and diſordering all the natural Functions more or leſs, according as it is more or leſs Violent.

Its Cauſe: The too great Fermentation in the Fluids.

Cauſe of that too brisk Fermentation.

What renders the Fermentation ſo brisk on this Occaſion is, that there is then in the Blood a larger Quantity of diſ-intangled Particles diſpoſed to ferment. Now there may happen an Influx of theſe all at once, and in great Plenty, or they may be collected inſenſibly, Several Circumſtances which may occaſion this brisk Fermentation.

ſibly, and by Degrees, to exert themſelves after a certain Time.

A Debauch.

A Cold.

For Inſtance, a Fever may be the Conſequence of a Debauch; or it may happen, that a cold Air may give a ſudden Stop to a plentiful Perſpiration. On this Occaſion, all the Particles of the Liquors, of the Wine or Meat, or Thoſe which have been hinder'd from perſpiring, being retain'd in the Blood, will give a quick and large Acceſſion to thoſe Parts of the Blood which are diſpoſed to ferment; whence will follow a brisker Fermentation, *i. e.* a Fever.

Idleneſs.

Sleep.

Diet.

Anxiety.

Thick and ill-digeſted Chyle.

On the other Hand, a Fever may proceed from an Habitual Indolence and Inactivity, from Exceſs of Sleep, from too rich and plentiful Diet, or from great Anxiety of Mind. It may likewiſe ariſe from an unperceiv'd Diſorder in the Digeſtions, or from ſome other Cauſe which ſhall have furniſh'd the Blood with a Crude, Sowre, Indigeſted Chyle, and by that Means ſhall have thicken'd to a great Degree all the reſt of the Juices, and render'd the Secretions imperfect. In all theſe Circumſtances, the Juices or Humours, thus changed and become peccant, remain a long while intangled in a thick and viſcous *Lympha*. There are they amaſs'd, there are they heap'd together, unable to diſingage themſelves, 'till after ſome Time: and then it is that the Fermentation becomes too brisk, and the Fever diſcovers itſelf.

Diviſion of Fevers into

Fevers are diſtinguiſhed into *Intermitting* and *Continued*.

Intermitting;

An *Intermitting Fever* is that which intirely ceaſes, and leaves the Patient in his natural State, for ſome Time; after which it returns afreſh, oftentimes at the ſame Hour it begun the Day or ſome Days before.

Continued;

We call that a *Continued Fever*, which does not intermit, but continues obſtinately, without a Total Interruption; for we are not to eſteem as Intermiſſions, thoſe Intervals, wherein its Violence appears ſomewhat abated.

Diviſion of Intermitting Fevers: *Quartan*, *Tertian*, *Double Tertian*;

If the Intermitting Fever diſappears, and leaves the Patient at his former Eaſe, for Two whole Days together, 'tis called a *Quartan*; when it returns every other Day, it is called a *Tertian*; and laſtly, A *Double Tertian*, when it is felt every Day; but has, each other Day, a Fit more violent than the former.

How a Continued and Intermitting Fever are formed.

All theſe Fevers are occaſioned by an Alteration in the Juices or Humours with which the *Lympha* is clogged; but theſe Humours are not thrown off all at once; Part of them unite with the Lymphatic Juices diſcharged into the *Primæ Viæ*, that is, into the Stomach and Inteſtines. There they aſſemble and tumultuate; there they corrupt the Aliment; after which, they are diſengaged, thrown into the Blood, and cauſe a Fever. When they continue to be thus diſſolved, and thrown off without Intermiſſion, they produce a Continued Fever; but when, to unfold and expand themſelves, they require ſeveral Hours, or even Days, they cauſe Intermitting Fevers.

The Length and Return of the Fits, depending on the Diſſolution of the Humour.

The Duration and Return of this laſt Sort of Fevers, depend upon the Quality of the Humour; upon the Facility and Plenty with which it diſengages itſelf, and upon the Time it requires to get clear of the *Lympha*, and to expand itſelf through the *Primæ Viæ*.

Arguments for the Flux of the Humours into the *Primæ Viæ*, when got clear of the *Lympha*, from different Sorts of Vomiting.

We venture to lay down, That the Humours contained in the *Lympha*, when they diſengage themſelves, do naturally go off in Abundance, through the Glands of the Stomach and Inteſtines; and this not withot Foundation; for we often meet with them in the Stomach, upon opening dead Bodies: beſides, can there be any Room to queſtion this, if we do but attend to the Cauſe of ſeveral Sorts of Vomitings? Such as thoſe which are every Day excited, by preſenting an offenſive Object to the Sight, or even Imagination; thoſe which follow after *Syn-*

*copes* and Swoonings; which happen to many at Sea; which torment Women during their going with Child; which are provoked by *Emetics* in the moſt perfect Health; which follow certain Indigeſtions, when more is thrown up than has been taken in; which commonly precede Acute Diſeaſes, and often happen in the Cold Fits of Intermitting Fevers.

But none deſerve more Attention, than the Vomitings we ſee happen in *Nephritic Pains*, when the Reins are obſtructed. In this Caſe, the Urine ceaſes to filtrate through theſe Parts in that Plenty which it ought: Part of it, remaining neceſſarily in the Maſs of Blood, quickly unites with the Juices which flow through the Glands of the *Primæ Viæ*, eſpecially thro' thoſe of the Stomach: Hence proceed Reachings and Vomitings. Of this there needs no ſurer Proof, than that, what the Perſon, thus afflicted, throws up, has a Strong Urinous Smell. Now theſe ſeveral Evacuations, particularly the laſt, evidently ſhew, How eaſily and quickly the Humours mixed with the *Lympha* diſengage themſelves, go off, and flow through the Glands of the *Primæ Viæ*.

Other Proofs from the vitiated Taſte in Jaundices.

Laſtly, The depraved Taſte; the ſudden Loſs of Appetite; the Nauſeatings, *&c.* which happen in Jaundices, Green-Sickneſs, and Fevers, together with a Thouſand other Symptoms obſerved in Diſeaſes, will furniſh an Attentive Phyſician with Proofs of this Fact paſt all Diſpute.

Cauſe of the Cold Fit in a Fever.

We are now to inquire into the Effects produced by theſe diſengaged Humours, when having flowed into the Veſſels of the *Primæ Viæ*, they come afterwards to mix with the Blood. Firſt of all, they thicken it by means of that Sowreneſs and Crudity they bring along with them: They abate, therefore, its Fermentative Motion; and, conſequently, the Heat of the Parts, and Strength of the Pulſe: Then ſucceed the Coldneſs, Lowneſs of Pulſe, Shiverings, Yawnings, and other Symptoms, which precede the Paroxyſm of an Intermitting Fever.

Cauſe of the Hot Fit.

This is the State which we commonly call the *Cold Fit*. At this Time, the Humours in the Blood cannot long circulate, but they muſt diſſolve and meet with a Number of Particles diſpoſed to ferment: They, therefore, cauſe a Fermentation, whoſe Briskneſs is in proportion to their Quantity. This is what kindles the Fever, and renders it more or leſs Burning.

But

**Cauſe of the Eaſe after the Fit.**

But when all theſe Particles have boiled for ſome Time, and have no longer a Diſpoſition to ferment together, the Juices ceaſe to be agitated; their Tumult is quieted, and their Natural State inſenſibly returns.

**Cauſe of the Periodical Return of the Fits.**

During the Paroxyſm, thoſe indigeſted Humours, which were intangled in a Thick *Lympha*, and detained in the Lymphatic Veſſels, do not ſufficiently partake of the General Motion of all the Fluids; ſo that what paſſes in the Blood, is not able to diſſolve them: They require a fixed and limited Time for their Digeſtion and Diſſolution. This is what makes the *Type*, or *Period* of Intermitting Fevers ſo regular.

**Difference of the Humours which produce Continued and Intermitting Fevers.**

On the other Hand, there is reaſon to believe, the Humours which produce *Continued Fevers*, are thinner, and more diſengaged, than thoſe to which Intermitting Fevers are owing. Hence it happens, that theſe continue to diſengage themſelves without Interruption: Indeed, we do not perceive Continued Fevers to be attended with an Obſtruction in the Glands, not inflamed, which, nevertheleſs, frequently happens in Intermitting Fevers.

**Theſe Fevers begin in the ſame Manner.**

Theſe Two Sorts of Fevers, begin always with an unperceived Diſſolution of the indigeſted Humours, mixed with the Lymphatic Juices, which flow thro' the Glands of the Stomach and Inteſtines. This is not to be diſputed, ſince each of them is commonly preceded by a Shivering, Vomiting, or Looſeneſs, *&c.*; but their different Genius is quickly after manifeſted, by their different Symptoms.

**Their Difference not diſcovered 'till after the Humours are got into the Blood.**

**In what that Difference conſiſts.**

In Continued Fevers, whilſt the diſengaged Humours, which are got into the Blood, excite there a brisk Fermentation, the others contained in the *Lympha*, go on ſtill to diſengage themſelves more and more, becauſe they are not ſo thick and indigeſted as thoſe in Intermitting Fevers. In the Blood they undergo the violent Motion with which it is agitated; they there diffuſe themſelves continually, and conſtantly keep up that intenſe Fermentation, upon which depends the Continuity of the Fever, and yet a certain Quantity of them flows conſtantly into the *Primæ Viæ*, which afterwards paſſes into the Blood, and there produces thoſe Paroxyſms which are often felt at a certain Hour. There is no diſcernable Cold Fit, as in Intermitting Fevers, becauſe the Blood is in too brisk and too conſtant an Agitation; but before the Paroxyſm, there is obſerved a Diminution of the Pulſe, which we call *Concentration*. This ariſes from nothing

**Cauſe of the Paroxyſms in Continued Fevers.**

**Why not preceded by a diſcernable Cold Fit.**

**Whence the Concentration of the Pulſe before the Paroxyſm.**

elſe but the Mixture of Sowre Juices, paſſing out of the *Primæ Viæ* into the Blood, and abating its Fermentation.

Diviſion of Continued Fevers into Three Claſſes.

*Continued Fevers* may be divided into Three Claſſes.

Simple.

*The Firſt* comprehends thoſe Continued Fevers which are called *Simple.* We give them that Name, becauſe they are not attended with any Symptoms, but what neceſſarily accompany a Fever.

Attended with an Inflammation.

In the *Second* are contained, thoſe *attended with an Inflammation of ſome Part.*

Diſtinguiſhed according to the Part inflamed.

If the Inflammation attack thoſe of the *Thorax*, as the *Lungs*, the *Plura*, &c. the Diſeaſe is called a *Pleuriſy*, a *Peripneumonia*, *&c.* according to what Part is inflamed.

If it is thrown upon ſome of the *Viſcera* of the *Abdomen*, as the Liver, the *Uterus*, *&c.* it is called, *A Continued Fever, with an Inflammation of the Liver, of the Uterus*, &c.

Fevers with an Inflammation in the Brain, improperly ſtiled Malignant.

When the Inflammation is in the Subſtance of the Brain, or in the Membranes which infold it, the Continued Fevers, according to the Opinion of ſome Authors, ought to be called *Malignant*, and yet they are no more Contagious, than a *Pleuriſy*, or *Peripneumonia.* The Reaſon for aſcribing that Quality to them is, their ſeeming to lurk and diſguiſe themſelves for ſome of the Firſt Days, ſo as to eſcape the Diſcovery of the unattentive Phyſician. 'Tis true, if we do not, in ſome Manner, foreſee the Inflammations of the Brain, or its Membranes; if before applying proper Remedies, we wait 'till they ſhew themſelves by conſiderable Symptoms, the Means then uſed are often ineffectual. It is, therefore, only in a Metaphorical Senſe we give this Sort of Continued Fevers the Epithet of *Malignant*, as if we would impute to them, a Secret Deſign of concealing themſelves at firſt, that afterwards they might give the more deadly Blow.

Fevers commonly ſtyled Malignant, not infectious, like thoſe properly ſo called.

However that be, this Denomination ought, in no wiſe, to convey an *Idea* of that contagious Malignity, which belongs to Fevers properly called *Malignant*. This would be abuſing the Credulity of Mankind, and an Attempt to terrify by the Help of an Equivocal Term. It muſt be confeſſed, Theſe Fevers are very dangerous; but neither more terrible, nor incurable, than a *Pleuriſy*, or an Inflammation of ſome Parts in the *Abdomen*. They ought, therefore, to be barely ſtiled, *Continued Fevers, with an Inflammation of the Brain, or ſome of its Membranes.*

Malignant Peſtilential Fevers.

A Third Claſs of Continued Fevers are, *Thoſe which are really Malignant and Peſtilential.* At firſt Sight, one would judge, they ought to be comprehended in the Second Claſs, ſince their Danger conſiſts in that almoſt univerſal Inflammation which attends them. Nevertheleſs, they ought to be diſtinguiſhed from the other, on account of the Extent of the Inflammation, which frequently, at once, ſeizes the Head, *Thorax*, *Abdomen*, nay, the whole Habit of Body. Beſides, the Quality of the Humour, which cauſes the Inflammation, makes its Progreſs equally rapid and fatal. Theſe Reaſons have determined us to rank under a Third Claſs, *Continued Malignant Fevers*.

Symptoms denoting Malignant-Peſtilential Fevers.

Theſe are denoted by certain Spots in the Skin, by Inflammatory Tumors and Obſtructions in the *Parotid Glands*, in the Groin, and Arm-Pits, &c. Upon opening Bodies which have died of theſe Diſeaſes, we have always found great Inflammations in the Brain, often in the Breaſt, in the ſeveral *Viſcera* of the *Abdomen*, or in all theſe Parts together.

Inflammations of the Brain and other *Viſcera*.

Cauſe of an Inflammation.

I have ſhewed, That all Fevers in general depend upon the Humours contained in the *Lympha*. We are now to inquire, what may cauſe an Inflammation, that Symptom ſo dreaded in all Fevers.

Of

## *Of the* INFLAMMATION *of the* PARTS.

Not the Stoppage of the Blood in the Veſſels.

Arguments againſt that Opinion.

IT is commonly thought, an Inflammation is nothing but an Obſtruction of the Blood in its Veſſels. I myſelf continued in this Opinion for a conſiderable Time; but in examining it more ſtrictly, I have found it impoſſible to anſwer the Objections it is liable to; for how to account for that conſiderable Redneſs which befalls the inflamed Part, eſpecially when it is naturally White, and ſlenderly provided with Blood-Veſſels?

Redneſs of the inflamed Part.

Beſides, To what Cauſes ſhall we aſcribe the Stoppage of the Blood in theſe Veſſels, ſince it always flows out of a Narrow Channel into a Wider? Concerning this, there are Two Obſervations to be made:

The Structure of the Sanguinary Arteries.

The Branches of each Artery taken together, form a Cavity, greater than that of the Trunk, whence they ariſe.

The larger Quantity and Diameter of the Sanguinary-Veins.

Again, The Cavity of the Capillary-Veins, in which theſe Branches terminate, is greater than theirs.

This being ſuppoſed, it is very difficult to conceive how the Blood can ſtop in its Veſſels; where, in a Fever eſpecially, its Motion is ſo brisk and violent.

The

Inflammation of the Eyes, ſhewing the Cauſe of an Inflammation in General.

The Obſervation of what paſſeth in an Inflammation of the Eye, hath helped us to diſcover the Cauſe of an Inflammation in general. In this Caſe we ſee the *Tunica Conjunctiva* (the White of the Eye, as it is commonly called) all over covered with Red Veſſels full of Blood: This ſhews an Inflammation. For, in the natural State, theſe Veſſels, which are deſigned only to contain a tranſparent Lymphatic Fluid, are not clearly to be diſcerned.

Whence the Redneſs in Inflammations.

Upon this Foundation, we found no Difficulty to conceive, That this Redneſs, or Inflammation of the Eye, is cauſed by the Blood's having paſſed out of its own, into the Lymphatic Veſſels, belonging to this Part. We then reflected, that all the other Lymphatic Arteries ariſe from the Capillary Blood-Veſſels, and diſtribute themſelves in great Plenty throughout the Body. This Reflection made all the Difficulty we were under to account for an Inflammation, vaniſh at once, and gave us a very clear *Idea* of it. We eaſily perceived, it could only ariſe from the Blood's flowing into the Lymphatic Arteries of the ſeveral Parts, as we had obſerved in this Caſe of the Eye; and as we ſee, happen, even without Reflection, in the Lymphatic Veſſels of

Inflammations in General cauſed by an Irruption of the Blood into the Lymphatic Arteries.

of the Skin, whenever Red Spots, Pimples, Boils, Abſceſſes, *&c.* ariſe there.

This Notion confirmed by Anatomy.

Anatomy confirmed this Notion. 'Tis true, it only ſhews the moſt conſiderable Lymphatic Veſſels. It is not able to diſtinguiſh the greateſt Part of them, they being too minute and intricate to be plainly diſcerned. Nevertheleſs, do but obſerve the numberleſs ſmall Veſſels Injections offer to our View; conſider, they neither appear Red nor full of Blood, during the Life of the Animal, and in its natural State; and then we ſhall eaſily perceive, that they can be, and are, nothing, in reality, but Lymphatic Veſſels, though moſt Anatomiſts appropriate them to the Blood.

Lymphatic-Veſſels imperceptible during Life, made appear in Dead Bodies by nice Injections.

Digreſſion concerning the Inconveniencies reſulting from Injections,

It may not, therefore, be improper to obſerve, by the Way, that theſe fine Injections do often ſerve rather to lead us into Error, and are more for Oſtentation, than for Inſtruction and Uſe. They may, indeed, guide us to very important Diſcoveries, it muſt be allowed: But they are alſo capable of hiding a great many Truths from us, and of ſtifling ſeveral Diſcoveries. The Confuſion, into which they throw the Sanguinary and Lymphatic Veſſels, frequently hinders us from diſtinguiſhing them with the neceſſary Exactneſs.

However, without regard to this Digreſſion, ſince a well-managed Injection can paſs out of the Sanguinary into the Lymphatic Veſſels after Death (a State wherein all the Parts are depreſſed) is it not evident, *à fortiori*, that the Blood may flow into the ſaid Veſſels during Life? He will be fully convinced whoever carefully attends to the following Mechaniſm.

**Juſt Inference from the Effect of nice Injections upon Dead Bodies.**

The Lymphatic Veſſels are diſperſed through all the Parts of the Body, as well as the Blood Veſſels; we may venture to affirm, They are more in Number; but they are harder to be perceived, becauſe they are very ſmall, and contain a clear tranſparent Liquor. In their natural State, they cannot admit the Blood, becauſe, where they commence, they are too ſlender; or rather, becauſe the *Lympha*, which they contain, is a Fluid wholly differing, in its conſtituent Parts, from the Globules of the Blood. And, indeed, though it circulates along with thoſe Globules in the Blood Veſſels, it never perfectly mixes with them. By the Help of a Microſcope, one may always diſtinguiſh it from the Red Part of the Blood, in the Blood-Veſſels of Living Creatures; as in the Meſentery of a Frog; in the Fins and Tails of certain Fiſhes, &c. But if the Lym-

**How the Blood may force itſelf into the Lymphatic Veſſels during the Life of the Animal.**

Either by the Dilatation of theſe Veſſels, or its own violent Motion.

Lymphatic Arteries happen to dilate, or if the Blood is put into a violent Motion, it may open itſelf a Paſſage into them; for then its Force will be ſuperior to the Reſiſtance, either of the Lymphatic Veſſel itſelf, or of the Fluid it contains.

Experiment confirming this Mechaniſm.

Take, for Inſtance, a Piece of Cloth dipped in Oyl, or any other Liquor, dip one End of it into a Veſſel containing that Liquor mixed with ſeveral others; it will only filtrate that which it had at at firſt imbibed; but if we pull and ſeparate the Threds which compoſe the Piece of Cloth; or if we boil violently the mixed Liquors in the Veſſel, then, beſides that which it had at firſt imbibed, it will ſuffer others to make their way through its Contexture.

Accidents by which the Lymphatic Arteries may be dilated.

What then ſhall hinder, but that the Filtrations in our Bodies may be diſordered by ſeveral Accidents? In a violent Fever, the Rarefaction of the Blood will very much dilate its own Veſſels; the Lymphatic Veſſels likewiſe will be dilated; either becauſe the *Lympha* they contain will be rarefied, or becauſe the Dilatation of the Blood Veſſels muſt neceſſarily diſtend the Orifices of the other, which are connected with them. The Blood, in violent Agitation, will make a much greater Effort againſt theſe Veſſels thus dilated. Beſides, theſe Fluids will then be more confuſedly mixed, thro' the Tumult they are in; ſo that no wonder if the Blood, in this State, makes its Way into the Lymphatic Arteries.

Stagnation of the Blood in the Lymphatic Veſſels, eaſily happening whenever that Fluid ſhall penetrate thither.

Theſe Veſſels are very ſlender, and have little or no Elaſticity; ſo that their Force is far inferior to that of the Sanguinary Arteries. Here, then, the Blood may well choak up the Paſſage; 'twill ſtagnate, and dilate the Veſſels to an exceſſive Degree. This will produce *a Redneſs*, a greater *Heat*, and *Painful Tenſion* of the Part; that is to ſay, *an Inflammation*.

Three Symptoms of an Inflammation.

Whence the Redneſs of the Inflamed Part.

It is eaſy to conceive, That the Part muſt become more Red; becauſe ſeveral Veſſels, which before contained only a clear, tranſparent Fluid, are now ſurcharged with a Red one, namely, the Blood.

Cauſe of the greater Heat.

This Part muſt acquire a greater Degreee of Heat, ſince the Blood, in this Caſe, fills a greater Number of Veſſels, and in greater Quantities, than it did before.

Cauſe of the Painful Tenſion.

Laſtly, To comprehend whence the exceſſive Pain, that conſtantly attends an Inflammation, ariſes, we need only remember, what has been before obſerved, that the Lymphatic Veſſels are all placed between Membranes. They are connected with them by Fibres, paſſing from one to the other, and forming, by their Diſpoſition, that Cellulary Contexture, which is conſtantly found between them. Now when the Blood, entering into the Lymphatic Veſſels, begins to dilate them, that Dilatation neceſſarily gives a greater Tenſion to all the Part. It ſtretches all thoſe Fibres which connect the Membranes: it ſometimes, even breaks them, or, at leaſt, cauſes ſuch a twitching Pain, as is the more violent, in proportion to their Tenſion.

**Sometimes attended with a violent twitching, or even breaking of the Membranous Fibres.**

We ſhall here obſerve, That the too great Rarefaction of the Blood and *Lympha* in general, is not always the ſole Cauſe of the Irruption of the Blood into the Lymphatic Arteries. It is eaſy for it to open its Way, whenever thoſe Veſſels ſhall be more dilated. And this may happen, as often as the *Lympha* contained in them, ſhall be rarefied, or thickned by ſome external Cauſe; ſuch as either a too warm, or too cold an Air. In this Circumſtance, the Blood will find no Difficulty to get into the Lymphatic Arteries, though its own Force ſhall not be at all augmented.

**External Accidents may ſometimes cauſe the Inflammation of a certain Part, without any Diſorder in the Maſs of Fluids in General.**

There are Two Conſequences naturally flowing from what has been here laid down.——*Fevers* are always cauſed by groſs, indigeſted Humours, contained in

**General Conſequences, with reſpect to Fevers and Inflammations.**

Conſtant Cauſe of *Fevers.*

in the *Lympha*, and ſtagnating, as it were, in the Lymphatic Veſſels.

Conſtant Cauſe of an *Inflammation.*

*An Inflammation* is produced by nothing elſe but the Irruption of the Blood into the Lymphatic Veſſels, and its Stoppage there.

Come we now to the general Indications, which this Theory furniſheth us with, pointing out the right Method of Cure in Fevers and Inflammations. We ſhall begin with Fevers.

## *Of the* CURE *of* FEVERS; *and the* Uſe *of* Vomits *and* Purges.

Principal Intentions in the Caſe of Fevers.

First Indication, to make the Humours which produce them more fluid.

IT is not to be doubted, but that the thick and groſs Humours contained in the *Lympha*, are the Sole Cauſes of a Fever. In order to the Cure therefore, we are to render thoſe Humours more fluid, and to promote their Evacuations. Now we know:

Second Indication, to promote the Evacuation of thoſe Humours thro' the Glands of the *Prima via.*

*There are no Parts*, thro' which the Lymphatic Humours go off with more Eaſe and Plenty, than thro' the Glands of the *Prima Via.*

*That theſe Viſcera*, are as it were the Center and Reſervatory, where the Humours which keep up the Fever are collected. Theſe are therefore the Parts which ought to be cleans'd. It is through their Glands, that we are to diſcharge the Humours with which the *Lympha* is ſurcharg'd. And to this we are invited by the natural Diſpoſition thoſe Humours have to flow through theſe Glands.

**Vomits and Purges the only Remedies capable of anſwering theſe Indications.**

From theſe Principles we readily conceive the Uſefulneſs of Vomits and Purges. Theſe are the only Remedies capable of breaking and attenuating the Humours, and of determining them to filtrate in more abundance thro' the Glands of the *Primæ Viæ*. They alone can be ſucceſsfully uſed, in order to diſcharge theſe Glands from an indigeſted, viſcous, thick *Lympha*, which choaks them up, and hinders the Humours from paſſing freely.

**Advantages of Vomits over Purges.**

To produce theſe Effects, *Vomits* have ſuperior Influence to *Purges*. They diſcharge the Glands more thoroughly; beſides, by means of the Efforts with which the Action of Vomiting is attended, they give to all the Parts of the Body a contractive Motion, ſometimes pretty violent indeed, but always ſalutary. Then, all the Veſſels compreſs'd and ſhaken, communicate the ſame Impreſſions to the Fluids they contain. The thick, indigeſted *Lympha*, which had damm'd up certain Lymphatic Veſſels, is now divided, ſhaken, agitated and forc'd to paſs into more conſiderable Veſſels; its Circulation is now reſtored. In its Turn 'tis made to undergo the violent and general Agitation of the other Fluids. It acquires a greater Fluidity and Purity, and arrives at laſt at that Conſtitution which is requiſite to its paſſing freely through its ſeveral Strainers. It is this Fluidity and perfect Diſſolution of the Humours, which the Ancients have choſe to diſtinguiſh by the Name of *Coction*: As by that of *Orgaſmus* they have denoted their tumultuous, inteſtine Motion when they unfold and diſſolve themſelves. We have a remarkable Inſtance of this in the Paroxyſm of the Fever, which precedes the Eruption of the Small-Pox.

Vomits not ſubject to cauſe a Rarefaction of the Fluids and Irritation of the Solids, as ſome Purges are.

Another Advantage which Vomits have over Purges, eſpecially thoſe made up of Reſinous Ingredients, is their neither cauſing any Rarefaction or Fermentation in the Fluids, nor convulſive Irritation in the Solids. This is to be chiefly underſtood of the uſual *Preparations* of *Antimony*. For thoſe which are drawn from Vegetables, being impregnated with a Reſinous Oil, do often cauſe pretty violent Irritations.

Action of Purges upon groſs Humours in attenuating and diſcharging them.

As to Purges, it is not by a briſk Concuſſion of the Solids, that they act upon the Fluids; but by that Diſſolution, which their Particles cauſe in the Blood, when, after having been digeſted and diffuſed in the *Primæ Viæ*, they enter the Blood-Veſſels, and break and attenuate the groſs Humours contain'd there. Our Practice furniſheth us with convincing Proofs of this; for we ſee every Day inward and outward Swellings ſoften'd and diſcuſs'd by the Help of Purges alone, which reſtore Fluidity to the thick Juices damm'd up in the Lymphatic Veſſels. We are therefore to look upon Purges as Medicines, whoſe Virtue is to diſſolve the Humours, and to evacuate them when diſſolv'd.

How Purges effect the Evacuation of the Humours.

They produce this Evacuation two Ways: The one is by communicating to the Humours, which they have render'd more Fluid, a Diſpoſition to unite with thoſe that flow thro' the Glands of the Inteſtines: The other by irritating the Fibres of thoſe *Viſcera* themſelves.

Two Precautions neceſſary to be obſerved before the Uſe of Vomits and Purges.

How effectual ſoever Vomits and Purges are in evacuating the Indigeſted Humours that cauſe a Fever, yet the raſh Uſe of them is to be avoided, and ſome neceſſary Precautions to be obſerved.

The Humours muſt be diluted.

*We ought before hand* to open and thin the Humours.

And the Solids ſuppled.

*The Solids* alſo ought to be prepared. It is neceſſary they ſhou'd be made more ſupple, and that the fleſhy Fibres of the ſeveral Parts be render'd ſufficiently flexible, in order to their aſſiſting the Action of the Purgatives, by a gentle moderate Contraction, which ſhall have nothing convulſive in it. The Veſſels ought to be free from all Obſtruction and Tenſion; eſpecially thoſe which ſurround the Secretory and Excretory Ducts; otherwiſe thoſe Tubes, unable ſufficiently to dilate, wou'd not afford an eaſy Paſſage to Humours ſtill remaining too groſs.

Diluting Medicines thin the Humours.

Nothing is more capable of anſwering theſe Intentions, than proper Diluting Medicines, and Bleeding. The Diluting Medicines will open the thick indigeſted Humours, gently penetrating and thinning them by degrees. Bleeding will leſſen the Expanſion of all the Fluids in general, which might otherwiſe ſwell and diſtend the Veſſels.

Bleeding leſſens the Inflation of the Veſſels.

*Cathartics* to be adminiſter'd at the proper Seaſon.

It is very dangerous to purge too ſoon; and equally ſo to purge too late. The Skill of the Phyſician, conſiſts as much in knowing the Times of uſing certain Remedies, and the Preparations to be uſed before their Application, as in the general Knowledge of the Nature of Diſeaſes, and of Medicines ſuited thereto.

Danger of purging too early. The Groſs Humours damm'd up.

If we purge too early, we ſhall not be able to evacuate Humours, which abide, and have, as it were, fix'd their Quarters

The Solids irritated too much.

Gentle Contraction of the Glands alone, procuring a ſalutary Evacuation.

in the Lymphatic Veſſels. The Solids will be too ſtiff, and the Irritation which the *Cathartic* will give them, will be rather a Convulſive Motion, than an eaſy, gradual Contraction, ſtraining and gently compreſſing the whole Glandulous Syſtem. And, yet, it is this gentle and moderate Compreſſion alone, which makes the Evacuation ſalutary. It is this alone, that can carry off through the Glands the Humours which have been open'd and diluted. When theſe are not ſufficiently ſo; when the Solids have not been made ſupple enough, the Convulſion they are put into, ſerves only to ſqueeze out of the Glandulous Bodies, a clear ſerous Liquor, which cannot be evacuated without Danger. For its Character is very different from that of the Groſs Humours, which cauſe and foment the Diſeaſe. It is very uſeful, and contributes much to dilute and thin them to that Degree which is neceſſary.

Ill Effect of the Convulſive Motion excited by *Carthartics*, when adminiſter'd out of due time.

Only Caſe wherein crude and indigeſted Humours are to be purged.

There is but one Circumſtance, wherein it is allowable to purge the Humours ſtill indigeſted. This rarely happens; but when it does, it merits all the Attention of the experienc'd Phyſician. Its Indication is, An almoſt univerſal Thickneſs, Stoppage and Obſtruction of the *Lympha* in its Veſſels. In this Caſe we cannot hope that Diluting Medicines alone, can have a ſufficient Effect upon ſuch a prodigious Quantity of thick Humours ſtagnating in the Veſſels. We muſt purge without Delay, and even with ſome Violence; not in hopes to procure a ſalutary Evacuation, but with a View of diſengaging the overcharged Solids, and of reſtoring ſome Degree of Motion to that conſiderable Volume of Fluids which wants it. After which we may apply ourſelves with good Effect to give them that Fluidity, and neceſſary Coction, which may produce uſeful and laudable Evacuations. This is what *Hippocrates* intended to ſignify by the following *Aphoriſm*: *Concocta purgare & movere oportet, non cruda; neque in principiis, niſi turgeant.*

With what view we then haſten the uſe of *Cathartics*

Aphor. §. I. 22.

The ſureſt Method of judging the Quality and Succeſs of Evacutions, is, to examine the Character of the Humours evacuated. They ought to have ſome Reſemblance with Peaſe-Soup, ſtronger or weaker, and of different Colours; and their Expulſion ought not to have weaken'd the Patient. There will be Reaſon to ſuſpect thoſe, which ſhall exhibit only a clear, greeniſh, or whitiſh Seroſity, and at the bottom nothing but a kind of grey and browniſh green Powder. We are to have no better Opinion of thoſe which appear of a very pale Yellow, and which

Quality of the Evacuations; how to judge of it.

Favourable Evacuations.

Suſpicious Evacuations.

are interſpers'd with a white ſlimy Matter in ſmall Pieces. It is certain neither of theſe come from a Diſcharge of the Glands. So that the little Eaſe derived from them will be ſcarce ſenſible, and but of a Moment's Duration: and they will contribute to give the Patient a Lowneſs of Spirits. This *Hippocrates* hath not omitted to remark in the follow-Terms: *Si qualia oportet purgentur, confert, & facile ferunt; contra vero ſi fiat, graviter.*

Dangerous Conſequences of the *laſt ſort.*

Aph. §. IV. 3.

A Riſque in delaying to purge too long.

We have ſhew'd how dangerous the haſty Uſe of *Cathartics* is. There is undoubtedly leſs Inconvenience in their Delay. And yet we riſque a great deal, if we forbear to preſcribe them, when every thing is diſpoſed to promote their Action; the Humours, by their Fluidity; the Solids, by their Suppleneſs; and the Secretory and Excretory Ducts of the Glands, by their being free and unclogg'd.

Accidents which may ariſe from that Delay.

In theſe Circumſtances, to delay purging wou'd give occaſion to new Accidents. The diſſolv'd Humours, circulating in the Veſſels, and endeavouring to paſs off, will not eaſily find their way of themſelves; or will not be diſcharged in ſufficient Plenty. Their Stay will keep up the Fever, and excite violent Paroxyſms. It may even give Occaſion to new Obſtructions in the Glands, to Inflammations, or other Diſorders equally terrible. For though theſe

Continuation and repeated Paroxyſms of the Fever.

Obſtructions in the Glands and Inflammations.

theſe Humours are thin enough to paſs thro' the Glands of the Inteſtines, yet they are commonly ſo groſs, as not to paſs through a great many of the other Glands, whoſe Orifices are much ſtraiter.

It is therefore abſolutely neceſſary, without Delay, to take the Advantage of the firſt favourable Diſpoſitions, which will admit the Uſe of *Cathartics.*

*Hippocrates* hath plainly ſhew'd this in his Treatiſe *de Epidemicis*, i. e. of *General Diſeaſes*, in the Inſtance of thoſe who recover'd of the Malignant Fevers, which he there deſcribes. They almoſt all of them owed their Recovery to conſiderable Looſeneſſes. Which ſufficiently ſhews how conformable the Uſe and Action of Purgatives are to the Operations of Nature itſelf. It wou'd be a vain Attempt to ſubſtitute in their ſtead other Remedies evacuating by Sweat or Urine. The Effect of theſe is always fallacious or uncertain; nor can we have any Dependance upon them, without running the Hazard of letting ſlip the moſt favourable Opportunities. They are only the fineſt Parts of the Humours which go off theſe ways. The groſſer therefore muſt neceſſarily remain in the Maſs of Blood much longer. In order to ſeparate them from it, we ſhall be obliged to break and attenuate them; which cannot

Epidem. L. I. 10. L. III. 3. &c.

Action of *Cathartics* conformable to the Operations of Nature.

*Diureticks* and *Sudorifics* not to be ſubſtituted in the room of *Cathartics*, without Hazard.

be done without the putting them into a violent dangerous Motion, the Conſequences of which, are very often Inflammations, or other hurtful Accidents.

In violent Diſeaſes and continual Fevers, it is neceſſary to evacuate plentifully.

What has been ſaid, will, I believe, ſufficiently evince both the Neceſſity of Purging, and the Preference due to *Emetics* and *Cathartics* over other Medicines. But in Diſeaſes of the higher Rank, eſpecially in continual Fevers, it will not be ſufficient to purge gently and with too much Caution. No perfect Cure is to be expected from Evacuations, unleſs they are proportion'd to the Quantity of the vitiated Fluids, which produce and keep up the Fever. Now of what Extent muſt the Volume of theſe be, ſince the Weight of all the Fluids in general, is five or ſix times greater than that of the Solids? Beſides, it is not from theſe vitiated Humours alone, that we are to diſcharge the Veſſels: We are, over and above, neceſſitated to expel all the Humours derived from the Aliment the Patient uſes every Day, and which he can only digeſt imperfectly.

Reaſon of this, the Quantity of the vitiated Humours.

Another founded on Experience.

Whatever Attempts we make, we ſhall never be able to anſwer both theſe Intentions, without plentiful and repeated Evacuations. To be convinced of this by Experience, we need only reflect upon the Influence of thoſe, which are raiſed in all Acute, and ſome Chronical, Diſeaſes.

Example taken from the Effects of *Mercury*.

Let us chooſe, for Inſtance, the Evacuations rais'd by *Mercury*. The Quantity of *Saliva* diſcharged during the Uſe of it, far exceeds the Weight of the whole Body in perfect Health. But its Diſcharge will be much leſs, and conſequently no perfect Cure obtain'd, if this Remedy be not taken in a Quantity ſufficient to produce compleat Evacuations.

Theſe alone can eradicate the Cauſe of the Diſeaſe; and theſe cannot be render'd plentiful enough, without the Repetition of the Medicines which produce them.

From the Uſe of the *Bark* and of *Deobſtruents*.

The *Cortex* (if uſed but a ſhort time) does not abſolutely cure intermitting Fevers, but only ſtops them. The ſame thing may be ſaid of *Steel* and other *Deobſtruents*. When they are not long enough uſed, they may indeed remove the Symptoms, but they will not reach the Root of the Diſeaſe, which will infallibly ſprout out afterwards.

Reaſon from the ſucceſſive Diſſolution of the Humours.

Another Reaſon, not leſs concluſive than the Examples here cited, for the frequent Repetition of Purges, is, that all the Humours contain'd in the *Lympha*, and remaining obſtructed in the Veſſels, are not diſengaged all at once, but ſucceſſively and by degrees. It is therefore neceſſary to aſſiſt the Progreſs of their

Motions, by imploying *Cathartics* in proportion to their Solution.

Another from Relapſes occaſion'd by Humours left undiſcharg'd.

Laſtly, what muſt neceſſarily determine us on theſe Occaſions to uſe copious and frequent Purging, is the dangerous Inconvenience which wou'd ariſe from the contrary Practice. Indeed, the Remainder of the Humours, which have been ſpared, and which ſhall be detain'd in the Veſſels, wou'd either foment the Diſeaſe, or bring on infallible Relapſes. *Quæ relinquuntur in morbis poſt Criſim*, (ſays *Hippocrates*) *recidivas facere ſolent.*

Aph. §. II. 12.

Principle to be recollected; *viz.* Solution of the Humours and Suppleneſs of the Solids, ought to precede Purging.

Symptoms denoting theſe two Diſpoſitions.

Before we came to demonſtrate the Neceſſity of copious Purging in acute Diſeaſes, we laid it down as a Principle, that this Evacuation is not to be attempted, till the Humours ſhall be ſufficiently attenuated and diſſolv'd, and the Solids diſengaged and ſuppled. We therefore cannot forbear giving a general View of the principal Symptoms denoting that Solution of the Humours, and Suppleneſs in the Solids.

In the Skin.

The *Heat and Dryneſs* of the Skin and Tongue are then conſiderably abated, and thoſe Parts become moiſt.

In the Pulſe.

The *Pulſe* is not ſo hard and contracted.

The *Beats* of the Arteries are not ſo dry, and are more diſtinct.

*The Parts* are leſs firm to the Touch. In the Solids;

*The Tendons* of the Wriſt are more ſupple, and not ſo tenſe as before.

*The Muſcles* of the Belly leſs rigid and more flexible.

*The Belly*, though inflated, yields to the Touch, eſpecially about the *Hypochondria*. In the Belly;

The Patient has *Grumblings* in his Belly, and an Inclination to go to Stool.

The *Excrements* diſcharged that Way, have acquired their proper Coction and Colour. They are not Crude, but Thick; Yellow, or Brown. In the Excrements;

*The Urine* loſes its former Qualities: It becomes leſs red and ardent, or leſs crude, and better coloured. In the Urine;

The Patient's *Thirſt* is abated. Other favourable Symptoms,

*The Violence* of the Symptoms, which aroſe along with the Fever, is mitigated and diminiſhed.

After having repreſented in general the Neceſſity of Purging in Fevers, and the requiſite Precautions, in order to the Seaſonable Uſe of that Remedy, we will, in the next Place, inquire into the General Methods, which ought to be uſed for the preventing or aſſuaging the Inflammations of the Parts; a very common Accident in all Continued Fevers, and no leſs fatal, when it is ſuffered to come to a certain Height. Method of Cure in Inflammations.

*Of*

## *Of the* Cure *of* Inflammations, *and the ſeveral Uſes of* Bleeding.

Stagnation of the Blood produces an Inflammation.

AN Inflammation, as we have already ſhewed, is cauſed by the Irruption of the Blood into the Lymphatic Veſſels, and its Stagnation there. Now there are but two Things which diſpoſe it to make its Way thither.

Cauſed either by the Rarefaction of the Blood itſelf;

*Its own too great Rarefaction*, which puſhes it into the Lymphatics, and overcomes the Reſiſtance ariſing from the Structure of theſe Veſſels, and from the Fluid they contain.

Or the Rarefaction, or Thickneſs of the *Lympha*.

*The Rarefaction, or Incraſſation of the Lympha*, which conſiderably dilates its Veſſels.

General Intentions for the preventing Inflammations.

Theſe Principles afford Two General Intentions for the preventing of Inflammations.

To moderate the too violent Motion of the Blood.

We are obliged to diminiſh that too active and diſproportioned Force, with which the Blood is impelled againſt the Orifices of the Lymphatic Veſſels.

To diminiſh the too great Rarefaction, or diſſolve the Incraſſation of the *Lympha*.

It is of no leſs Importance, to correct the too brisk Rarefaction of the *Lympha*, or its too great Incraſſation; each of which, will occaſion an extraordinary Dilatation of its Veſſels.

In

Inflammations in Fevers depend cheifly upon the Fermentation and Rarefaction of the Blood.

In a Fever, the Inflammation depends chiefly upon the violent Fermentation, and too great Rarefaction of the Blood. Its natural impulſive Motion, how conſiderable ſoever, can only determine it to flow, with a greater Velocity, directly forward in its own Veſſels; but when it ferments too briskly, and is too much rarefied, it cannot fail of diſtending the Blood-Veſſels exceſſively. It makes its Effort againſt the Sides of theſe Veſſels, which are unable to contain it. At the ſame Time it dilates the Lymphatic Arteries, ariſing from theſe Veſſels, forces its Way into them, and cauſes an Inflammation.

In what manner this Fermentation or exceſſive Rarefaction cauſes an Inflammation.

Inflammation in the Brain generally occaſion'd by the laſt Cauſe.

This is the moſt ordinary way by which an Inflammation is form'd in the Brain. 'Tis true it may be produced there, as in other Parts, by the Obſtruction of the Glands. But, in general, the Brain being a ſoft Body, and the *Pia Mater* but a weak Membrane, it is eaſier for the Blood, when much rarefied, to produce in this Part, that is leſs fortified than the reſt, the Diſorders we have juſt now deſcribed. Here it more eaſily dilates the Blood-Veſſels than elſewhere, and finds fewer Obſtacles to hinder its Entrance into the Lymphatics.

How that is produced.

Tokens of it in Dead Bodies.

This Species of Inflammations is diſcover'd without any Difficulty, even in Dead Bodies, by thoſe who are accuſtom'd ſtom'd to Diſſections, and to examine carefully the Parts. For in this Caſe, the *Pia Mater* appears overſpread with a larger Quantity of Veſſels full of Blood, and throughout the *Medullary Subſtance* of the Brain are found a great Number of red Specks, which are hardly obſervable, but when this Part is inflamed.

Inflammations in the *Thorax* and *Abdomen* not owing to the above-mention'd Cauſe alone.

The too violent Motion and exceſſive Fermentation of the Blood, are ſufficient to produce this dire Effect in the Brain. But they cannot of themſelves have the ſame Operation on the Parts of the *Abdomen* and *Thorax*; for if theſe were the ſole Cauſes, the Inflammation ought to ſpread throughout all theſe Parts; becauſe the Veſſels here are equally fortified: Whereas we find it fixes upon one ſingle Part rather than another.

They alſo ariſe, either from the Incraſſation, Rarefaction, or too plentiful Stagnation of an Humour in the Secretory and Excretory Veſſels.

An Inflammation therefore of any ſingle Part, either in the Breaſt or lower Belly, is not produced by the Ebullition of the Blood alone, as is often the Caſe of the Brain. Its principal Cauſe is either the Incraſſation, Rarefaction, or too great Quantity of an Humour ſtagnating in the Secretory and Excretory Ducts of the Glands, through which it ought conſtantly to ſeparate.

Diſorders cauſed by the Humours ſtagnating in theſe Veſſels.

In this State, the Courſe of the Fluids is much more confined, than at other times, and the Lymphatic-Veſſels more dilated. The Secretory and Excretory Ducts, being choaked up, no longer give free Paſſage to all the Parts of the Fluid, brought thither by the Lymphatic Arteries. It ſwells and dilates them, and they, thus ſwoln and dilated, compreſs and cloſe up the Capillary Blood-Veins, with which they are interwoven. By this means, the Blood flowing in its larger Veſſels, unable to diſcharge itſelf into theſe ſmall ones, and finding the Orifices of the Lymphatic Arteries dilated, ruſhes violently into them. It dilates them ſtill more; ſo that the Part muſt needs be inflamed; muſt become redder, and ſo ſubject to greater Pain and Tenſion.

Dilatation of the Lymphatic Arteries.

Compreſſion of the Capillary Veins

Blood forcing into the Lymphatic Arteries.

If we do not ſpeedily oppoſe the Havock which the Blood may make in the Lymphatic Veſſels, it burſts them; it is extravaſated throughout the whole Contexture of the Part, and forms there, either an Abſceſs, a more extenſive Inflammation, or a Mortification itſelf; according as the Quality of the Humours is more or leſs vicious.

Rupture of theſe Veſſels, and Extravaſation of the Blood, attended with an Inflammation, or other Accidents.

This Theory affords Four Indications, of the utmoſt Importance, for the Prevention or Cure of an Inflammation. We are indeſpenſibly obliged,

Particular Intentions for averting or abating an Inflammation.

*To diminiſh*, ſufficiently, *the Expanſion of the Fluids.*

First Intention. To reduce the Fluids within due Compaſs.

Second Intention. To leſſen the exceſſive Plenitude of the Blood Veſſels.

*To empty the Blood Veſſels*; ſo that the Blood may no longer be in a Condition to act with Violence upon the Lymphatic Arteries; to force its Way through their Orifices; and to be carried in too great Plenty through the Blood-Veſſels of the Part threatned with an Inflammation.

Third Intention. To correct the too briſk Rarefaction of the Fluids.

*We ought likewiſe to abate*, by proper Medicines, the too great Rarefaction of the Fluids; for if we carefully obſerve the Fluids, which having been conſiderably diminiſhed in Quantity, do, nevertheleſs, continue to be rarefied, we ſhall find, That, notwithſtanding their Diminution, they take up, almoſt, the ſame Room, and equally dilate the Veſſels as before. Milk, and other thick Liquors, afford a plain Proof of this. Take a conſiderable Quantity of Milk out of a Coffee pot, remaining ſtill upon the Fire; this ſhall not hinder what is left, from filling the Veſſel and boiling over.

Obſervation concerning Liquors preſerving the ſame Expanſion, after having been diminiſhed in Quantity.

Fourth Intention. To remove the Obſtructions of the Secretory and Excretory Veſſels.

Laſtly, we are obliged *to free the Secretory and Excretory Ducts from their Obſtructions*, which foment the Inflammation. This may be obtained, either by thinning the Incraſſated Humour; or, by leſſening the Rarefaction, or diverting, thro' other Glands, the Courſe of the Humour flowing too plentifully into theſe Veſſels.

The

For the Firſt Indication, Bleeding and Purging neceſſary.

The Firſt Indication, namely, *To diminiſh the Volume of the Fluids*, lays us under an evident Neceſſity of employing Bleeding, in Conjunction with Purges.

For the Second, Bleeding alone.

To anſwer the Second, *viz. The emptying the Blood Veſſels*, 'tis to Bleeding alone we can have recourſe to any purpoſe. We ſhall ſhew hereafter, in what Manner it is to be uſed.

For the Third, *Cooling* Medicines, *Cathartics*, *Emetics*, and *Febrifuges*.

The Third Indication ſhews the Neceſſity *of quieting the exceſſive Rarefaction of the Fluids*. Here we can only hope to ſucceed by the prudent Uſe of cooling Medicines, of Purges, Vomits, and Febrifuges; the Application of which, we ſhall handle more at large in a particular Treatiſe concerning Fevers.

For the Fourth, Medicines ſuited to the Genius of the obſtructed Humours.

As to the Fourth Indication, which preſcribes *the freeing the Secretory and Excretory Veſſels from Obſtructions*; this neceſſarily requires the Uſe of *Specific Homogeneous* Medicines, that is, ſuch as are ſuited to the Genius of the Stagnating Humour. We ſhall explain this more at length, and more clearly, when we come to treat expreſly concerning Obſtructions of the Glands.

# *Of* BLEEDING.

Inquiry relating to Bleeding.

WE have before ſhewed, that Bleeding alone is capable of diminiſhing the exceſſive Quantity of the Blood; and that, in conjunction with Purges, it is proper to reduce within due Compaſs, the too great Expanſion of the Fluids. Here we are obliged to examine, with what Precautions ſo uſeful and ſo extenſive a Remedy ought to be put in Practice.

*Plethora*, or Fulneſs of the Veſſels, principal Motive for Bleeding.

What ought chiefly to direct the Uſe of it is, the Superfluity, or too great Rarefaction of the Blood, that is to ſay, A *Plethora*, or *Fulneſs of the Veſſels*.

Three Sorts of *Plethora's*.

This is diſtinguiſhed into Three Species, *viz.* A *True Plethora*, a *Baſtard Plethora*, and a *Particular Plethora*.

*True Plethora.*

*A True*, or *General Plethora* is, when the Quantity of the Blood is too great.

*Baſtard Plethora.*

In a *Baſtard Plethora*, the Quantity of the Blood is no greater than it ought to be; but it is too much rarefied, and by that Rarefaction, takes up the ſame Space, as if it abounded too much in Quantity.

*Particular Plethora.*

As to a *Particular Plethora*, it takes Place, when the Blood abounds more in one Part than in others. This laſt is a kind of Inflammation, but does not become really ſuch, except when the Blood gets into the Lymphatic Veſſels.

Bleeding equally neceſſary in each.

The quickeſt and moſt effectual Remedy, that can be applied to theſe Three Sorts of *Plethora's*, is Bleeding: and yet we muſt take care, not to carry it too far. Prudence requires it ſhould be ſuited to the Nature of the Diſtemper, and to other Circumſtances; leſt by endeavouring to prevent an Inflammation, and other Accidents which may ſupervene, we bring on others no leſs grievous. Nothing is more proper to ſhew the Inconveniencies of exceſſive Bleeding, than ſome neceſſary Reflections upon the Reciprocal Motion of the Solids and Fluids.

To be carefully uſed.

Reaſons for not carrying it too far, taken from the Reciprocal Motion of the Solids and Fluids.

Two Sorts of Motion in the Blood Veſſels; *Diaſtole* and *Syſtole*.

The Structure of the Blood Veſſels is ſuch, that their Coats have a conſtant Tendency to contract and diminiſh their Cavity. On the other Hand, the Blood preſſing laterally upon the Veſſels, diſtends and inlarges their Cavity. When they have been dilated to a certain Pitch, by the Blood which the Heart puſhes into them, they then return to their former State, by means of their contractive Power, or natural Elaſticity; and, in their turn, re-act upon the Blood.

Uſes of the *Syſtole.*

This *Syſtole*, or Contractive Motion in the Arteries, certainly depends upon their Dilatation; and ſerves for Two Principal Ends.

Firſt Uſe. To promote the Circulation of the Blood, and other Fluids.

The Firſt is, To puſh forward the Blood, and to make it flow to the Extremities. Hence proceeds its continual Circulation, and even, that of all the other Fluids; for the Rapid Courſe, with which it moves in the Blood Veſſels, gives Motion to all the Juices ſtrained from its Maſs. Moreover, the Dilatation of the Arteries, ſhakes and impels all the Veſſels which ſurround them. Thus the *Lympha* and other Fluids, are propelled, agitated, and made to circulate with the greater Facility.

*Diaſtole* contributing very much to this End.

As alſo the Contraction of the ſeveral Solids.

To this Contractive Motion of the Arteries, we are to add, That of the other Solids, which very much contributes to the Circulation of the Fluids.

Second Uſe. To break and attenuate the groſs Parts of the Fluids, and to divide thoſe which cohere too much.

Another Uſe of the Contraction of the Arteries, is, By a kind of continual Attrition, to ſubtilize and attenuate the Fluids; to diſunite their groſſer Parts, and to diſſolve thoſe which are fineſt and moſt capable of Fermentation. Laſtly, to divide exactly, and ſeparate thoſe which are apt to cohere moſt ſtrongly with each other.

Diſorders which are to be expected from exceſſive and too often repeated Blood-letting.

Weakning the Elaſtic Force of the Veſſels and Solids.

The Courſe of the Blood and Fluids check'd.

Languid Fermentation.

Faulty Solution and Secretions of the Juices.

Since the Dilatation of the Arteries, is the primary Cauſe of their Contraction, and that this Dilatation is performed by the Blood's being impelled and acting againſt their Coats; it is evident, if we diminiſh this to too great a Degree, we muſt needs weaken the Elaſtic Force of the Veſſels and Solids. When the Blood is in too ſmall a Volume, with reſpect to the too extenſive Cavity of the Arteries, its Impulſe againſt their Sides ceaſes. On this Occaſion, their *Diaſtole* muſt be weak; and, by neceſſary Conſequence, their *Syſtole* and Elaſtic-Motion, by which they react upon the Fluids, muſt be weakened too. The Blood, conſequently, is puſhed forwards with leſs Rapidity, and the Juices leave off to flow with the neceſſary Briskneſs. They, in a manner, ſtagnate in all the Parts, and are no longer ſufficiently broke and attenuated. The Fermentation languiſhes, the Solution is performed with Difficulty; and all the Secretions are imperfect. This happens chiefly when there is no Fever, or a very ſlight one; for when that is more violent, the Fermentation of the Blood is brisk enough to keep up a ſtrong Contraction and Dilatation in the Arteries.

Conſequence deduced from theſe ſeveral Diſorders, againſt exceſſive Bleeding.

Sole Occaſions which admit that ſort of Bleeding by way of Exception.

May we not, therefore, juſtly conclude, That too copious, and too frequently repeated Bleeding, muſt needs be dangerous and prejudicial? This is a General Rule, admitting no Exception, but in the Caſe of large Hæmorrhagies, of violent Burning-Fevers, and other Diſeaſes, in order to ſtop the Fury and Impetuoſity of the Blood. On all other Occaſions we ought to forbear too plentiful and reiterated Bleeding, otherwiſe we ſhall run the Hazard of the above-mentioned Inconveniencies.

Moderate Bleeding, and at proper Intervals, free from theſe Inconveniencies.

That does not deſtroy the due Proportion betwixt the Volume of the Fluids, and the Cavities of the Veſſels.

But when we Bleed moderately, and at juſt Intervals, we need not apprehend any ſuch. For then the Coats of the Arteries will have Time to contract inſenſibly; which their Structure diſpoſes them to. The Blood, though conſiderably diminiſh'd, will neverthleſs be able to continue its Action againſt the Sides of the Veſſels, and keep up their *Syſtole* and *Diaſtole*, by means of the due Proportion between its Expanſion and their Diameters.

Solution of ſome Difficulties taken from this Proportion.

This Proportion, ſo neceſſary to the Animal Life, when attentively conſider'd, will ſerve to reſolve ſome Queſtions, and to clear up ſome Difficulties.

Cauſe of Weakneſs, Swoonings, Thickneſs of the Blood, after Exceſſive Bleeding.

It ſhews the Reaſon of Swooning immediately after too copious Bleeding; why one continues for a long Time weak after a Fit of Sickneſs, wherein too much Blood has been loſt; and why the Blood becomes thick and filmy after repeated Blood-letting.

Bleeding not ſucceſsful in Diſeaſes occaſion'd by too thick Blood.

It confirms the Opinion of thoſe who look upon Bleeding as leſs neceſſary and ſucceſsful in Diſeaſes, occaſion'd by a conſiderable Thickneſs of the Juices, and not attended with a brisk Fermentation.

Why to be cautiouſly uſed in very Fat People.

Laſtly, it ſhews how cautious we ought to be in Bleeding thoſe of a very fat unwieldy Habit of Body. In ſuch the Weight of theParts does ſtrongly compreſs the Veſſels. It confines and deadens the Motion, which the Fluids would otherwiſecommunicate to them; ſo that itmight wholly deſtroy it, ſhou'd the Volume of the Fluids be too conſiderably diminiſh'd.

Diſproportion between the Fluids and Solids, Cauſe of the Convulſions after *Hæmorrhagies*.

To theſe Obſervations, which we thought were not to be omitted, may be added, That the Neceſſity of a due Proportion between the Fluids and Solids, evidently ſhews, that 'tis to the want of this the Convulſions and other Symptoms in *Hæmorrhagies* are to be aſcribed. The plaineſt Inſtance that can be given of this, is, that of a Dog, or any other Animal, from whom an exceſſive Quantity of Blood has been taken.

Concluſions relating to the ſeveral Precautions to be uſed in Blood-letting

Theſe ſeveral Reflections do in no wiſe tend to the total Excluſion of Bleeding; all that can fairly be inferr'd from them, is reducible to the following Heads.

First Concluſion.

*That it ought always to be regulated* according to the State of the Patient.

Second Concluſion.

*That in preſcribing it*, as well as other Remedies, the attentive Phyſician ought conſtantly to have in View the neceſſary Relation and Harmony betwixt the Motion communicated from the Fluids to the Solids, and reciprocally from the Solids to the Fluids.

Third Concluſion.

And laſtly, that exceſſive Bleeding may be very dangerous even in Fevers and Inflammations: Diſeaſes, wherein nevertheleſs, when carefully uſed, it is to be look'd upon as the ſureſt Relief, and without which all others wou'd be try'd in vain.

Uſe of Bleeding in the three Sorts of *Plethora's*.

Let us now inquire of what Uſe Bleeding may be in the different Sorts of *Plethora's*. The two Firſt, *viz.* The *True* and *Baſtard Plethora*, do indiſcriminately ſhew a Plenitude of all the Veſſels. They, therefore, abſolutely require Bleeding; no matter where; for 'tis ſufficient to empty the Veſſels. Nevertheleſs, we are not to proceed but with the following Cautions.

Precautions to be obſerved.

In the *True-Plethora*.

When we have to deal with a *True-Plethora*, we ought not to take away too great a Quantity at firſt, nor too quickly repeat the Operation. When we precipitately diminiſh the Quantity of the

Fluids, we too much weaken the Motion of the Solids. The only Conſequence of which wou'd be increaſing the Thickneſs and Dulneſs of the Blood, whoſe Texture is already too groſs, and Fermentation too languiſhing. We are therefore, obliged to wait till the Fermentation becomes more brisk; which will not fail to happen in a ſhort Time, as ſoon as the Air contain'd in the Veſſels, ſhall be able to expand.

Why Bleeding at firſt to be carefully managed.

Then will the *True-Plethora*, be chang'd into the *Baſtard* Sort, which has no other Cauſe than the too great Rarefaction of the Blood. A Circumſtance wherein plentiful and frequently repeated Bleeding is no longer dangerous. Inaſmuch, as in a *Baſtard-Plethora*, the Fermentation and Rarefaction of the Fluids, are more than ſufficient to keep up the neceſſary Motion in the Solids.

In a *Baſtard*: *Plethora*.

Why more plentiful and oftner repeated.

When a Fever attends either of theſe *Plethora's*, we are obliged to take away large Quantities; but always with a due Regard had to the Patient's Strength and Conſtitution, and to the greater or leſs Heat of the Fever.

Plentiful Bleeding when either is attended with a Fever.

Bleeding in this Caſe ought to be preſcribed during the Height of the Paroxyſm. Some Phyſicians have thought, without any Foundation, that it ought not to be uſed till after the Fever was ceaſed, or

Whether we ought to bleed betwixt the Paroxyſms.

or at leaſt much abated, that is to ſay, before or after the Paroxyſms. We cannot help being of a contrary Opinion, for the following Reaſons.

Reaſons againſt that Practice.

Difficulty of making the Blood to flow.

When we Bleed before the Paroxyſm, the Blood comes away with Difficulty, and frequently the Operation is attended with Swoonings. Beſides, the Paroxyſm ſucceeding quickly after, hinders the Patient from feeling any good Effect from it.

*Syncopes.*

Hindrance ariſing from Sweats.

When we wait till the Paroxyſm is over, the Sweats which then follow, oftimes oblige us to delay it for a conſiderable Time. The Blood iſſues with more Difficulty, and the Patient, already much weaken'd by the Violence of the Fever, becomes ſtill weaker, which muſt needs give him a Prejudice againſt Bleeding.

Bleeding during the Paroxyſm, not attended with theſe inconveniencies.

But if it is uſed in the very Height of the Paroxyſm, it cauſes the Blood to flow with Rapidity. The Patient ſupports it with the greater Vigour, and finds himſelf eaſed that very Moment. The Paroxyſms are by this means ſhortned and abated, and the Sweats ariſe with more Eaſe. Beſides, the Phyſician by this Method has an Opportunity, during the Intervals of the Fever, of giving the neceſſary Medicines to prevent or diminiſh the approaching Paroxyſms, which he is by no means to venture upon, while the Paroxyſm laſts.

To which we may add, That nothing is ſo much to be dreaded in theſe Fevers, as a conſiderable Diſtenſion of the Veſſels, or an Inflammation. Now theſe Two Accidents proceed only from the Rarefaction of the Fluids, which is never ſo great as during the Paroxyſms. But 'tis Bleeding alone, can avert theſe dangerous Conſequences: We are therefore to have Recourſe to it without Heſitation, at that Time, when the State of the Patient requires it. 'Twould be imprudent, and even dangerous, to delay it 'till that Time is laps'd: For then there will be Reaſon to apprehend the Dilatation of the Veſſels already perform'd, and the Inflammation begun. When we are unhappily fallen under this Inconvenience, our only Refuge will be reiterated Bleeding, againſt thoſe Diſorders, which might have been prevented by Letting-blood but ſome few Hours before.

Bleeding at that Juncture prevents the Conſequence of the Rarefaction of the Fluids, *viz.* the Dilatation of the Veſſels, and an Inflammation.

Repeated Bleeding the only Refuge under theſe Inconveniencies.

The Third Species of a *Plethora*, which only invades ſome Parts diſtinct from the reſt, and which almoſt conſtantly ariſes from Obſtructions in their Glands, does not barely indicate Bleeding in general; but preciſely ſuch as is moſt likely to relieve the affected Part.

Uſe of Bleeding in the third Sort of *Plethora's*.

Uſe of Bleeding when any one Part is inflamed.

As to the Choice we are obliged to make in this Caſe, I ſhall now inquire into that, having reſpect to the ſeveral Sorts of Inflammations, and to the different Parts of the Body upon which they may fall.

When they are once ſorm'd, their Progreſs, which ſo often proves fatal, is not to be ſtopp'd without the greateſt Difficulty. It is therefore incumbent upon us to endeavour their Prevention, from the Moment of their firſt Indications; and this is not to be effected without immediate and plentiful Bleeding. This alone is able to unload the Blood-Veſſels, and to hinder the Blood from forcing its way into the Lymphatic Arteries. But on theſe Occaſions, 'tis not enough to empty the Veſſels in general: If we would prevent the Inflammation of any ſingle Part, we muſt order Bleeding in ſuch a manner, as that it may chiefly relieve the Veſſels belonging to the Part ſo threatned. After which we are to uſe proper Medicines for abating the too brisk Fermentation of the Fluids; for correcting the *Lympha* either incraſſated or rarefied to Exceſs; and for removing the Obſtructions of the Glands.

It prevents an Inflammation when ſpeedily and plentifully uſed.

But ſo to be directed as chiefly to relieve the threaten'd Part.

Two Opinions about the Choice of two different ways of Bleeding in Inflammations.

Phyſicians have been very much divided concerning the Choice to be made of the Part where to let Blood, in order to take off a particular Inflammation.

Some, with Deſign to hinder the affected Part from being ſtill more and more overcharged by too great a Quantity of Blood flowing into it, have thought it neceſſary to divert its Courſe quite another Way, by the Help of what they call *Revulſive Bleeding*.

Revulſive Bleeding. Its Effect.

Others, on the contrary, have imagined, that the ſureſt Means to empty theſe overcharged Veſſels, was, to determine the Blood to flow plentifully thither, that by its Rapidity it might carry off what was there ſtopp'd. With this View they have recourſe to what is call'd *Derivative Bleeding*.

Derivative Bleeding, how it operates.

One ſingle Inſtance will ſuffice, to give a clear Conception of the Difference of theſe two Sorts of Bleeding. We ſhall take it from what may be practiſed, when the Veſſels of the Head are to be reliev'd.

If in this Caſe *Bleeding* is perform'd *in the Foot*, it is then *Revulſive*, becauſe it determines the Blood to flow towards the lower Parts, and hinders it from ruſhing in great Quantities upon the Part to be diſcharged.

Inſtance of Revulſive Bleeding.

If *in the Jugular Veins*, it is then *Derivative*; in that it cauſes the Blood to run towards the Superior Parts, and draws it in a larger Stream into the Veſſels of the Head.

Inſtance of Derivative Bleeding.

Derivative Bleeding hurtful in Inflammations.

It is eaſy to perceive this laſt Sort of Bleeding is not convenient in Inflammations. For, if it be true, as I think it cannot be diſputed, that theſe Accidents are cauſed by an Irruption of the Blood into the Lymphatic Arteries; does it not follow, that they muſt increaſe in Proportion to the greater Rapidity with which the Blood flows into the affected Part? Is it not then more likely to ruſh in greater Plenty into the Lymphatic Arteries? and muſt not its Impulſe againſt their Orifices be greater?

Revulſive Bleeding alone proper. Hinders the Influx of the Blood into the Lymphatic Arteries.

In theſe Caſes therefore, 'tis to *Revulſive Bleeding* alone we are to have Recourſe. When we keep off from the affected Part, a Quantity of Blood, which would otherwiſe be carried thither, we are ſure to leſſen both its Efforts againſt the Orifices of the Lymphatic Arteries, and the Dilatation of thoſe Veſſels themſelves. It will not be able to force its Paſſage into them, or will enter in leſs Quantities.

Conſequently prevents an Inflammation.

By this means we either prevent an Inflammation, or moderate its Violence; by which we ſhall gain ſo much Time, as is neceſſary for the Uſing ſuch Helps as are capable of clearing the Obſtructed Glands, of correcting the vitiated *Lympha*, and of preventing or abating the Paroxyſms of the Fever.

When

Or ſtops its Progreſs.

When the Inflammation ſhall have already fix'd itſelf upon any Part, the utmoſt we can hope for, is, to ſtop its Progreſs, by diverting the Blood from the Lymphatic Arteries. Our next Care muſt be to bring about, if poſſible, the above-mention'd Effects, by means of proper Medicines. For then the Globules of the Blood, which had introduced themſelves into the Lymphatic Arteries, being gradually diluted by the *Lympha*, which continually flows in, will paſs into the Lymphatic, and ſo return into the Sanguinary Veins. So that the Inflammation will diſperſe itſelf in a little Time after; in the ſame Manner as we ſee Inflammations of the Eyes, *Enchymoſes*, &c. go off inſenſibly.

Particular Caſe requiring Derivative Bleeding in Inflammations, in order to reſtore to the Veſſels their Elaſtic Force, and Motion to the Fluids.

We are nevertheleſs to obſerve by the way, that the Rule by which we have excluded *Derivative Bleeding*, is not ſo general as to admit of no Exception. When the Inflammation has been violent, and the Lymphatic and Blood Veſſels have undergone an exceſſive Dilatation, it often happens that they loſe their Spring, and do not retain a Force ſufficient to give Motion to the Fluids. Though we have thinn'd and diluted them, they will nevertheleſs continue ſtagnating in the inflamed Part. On this Occaſion *Derivative* Bleeding may be uſed with very great Advantage. Directing the Motion of the Blood that way, it will make it flow thither with great Rapidity. By its brisk and rapid Courſe, it will reſtore Motion to the ſtagnating Juices. It will carry them along with it: 'twill put the Solids in a Condition of recovering their Elaſtick Power, and will conſequently render the Circulation more free and perfect. But we are not to promiſe ourſelves theſe Benefits from *Derivative* Bleeding, except only in the Caſe here deſcribed, and that too when it ſhall have been preceded by repeated *Revulſive* Bleeding.

Difference between Revulſive and Derivative Bleeding more largely treated of.

What we have hitherto laid down concerning the Diſtinction between theſe two Sorts of Bleeding, and their different Effects, deſerves to be inlarged upon with more Accuracy.

Bleeding in the Foot Revulſive in Inflammations of the Head.

I have ſaid that Bleeding in the Foot is *Revulſive*, with reſpect to Inflammations in the Head.

Proved from an Axiom in *Hydroſtatics.*

This is founded upon a Principle in *Hydroſtatics*, according to which, *Fluids always move to that ſide, where they find the leaſt Reſiſtance.*

Application of that Principle to Bleeding in the Foot.

When we open a Vein in the Foot, we empty thoſe Arteries which tend to the lower Parts. The Blood, then iſſuing from the Heart, will meet with leſs Reſiſtance in the Deſcending Trunk of the *Aorta*, than in the Aſcending. It will therefore have a greater Influx that way, than into the Veſſels of the Head, or any which ariſe from the Aſcending Trunk. With reſpect to them therefore this Bleeding will be *Revulſive*; as that in the Arm, or in the Neck, is with reſpect to the Veſſels ſent out of the Deſcending Trunk.

Bleeding in the Arm and Neck, Revulſive in Inflammations of the lower Parts.

According to this Mechaniſm, in Diſeaſes of the *Abdomen*, or any other, wherein there is an Obſtruction in the Veſſels ariſing from the inferior *Aorta*, Bleeding in the Foot is of Neceſſity *Derivative*, that is, cauſes a greater Influx of the Blood and Fluids into the obſtructed Veſſels. The ſame Idea we are to have of Bleeding in the Arm, or Jugulars, in Diſeaſes cauſed by the Obſtruction of the Veſſels of the Head, or of others proceeding from the ſuperior *Aorta*.

Bleeding in the Foot Derivative with reſpect to theſe.

Bleeding in the Arm and Neck, Derivative with regard to the Head and upper Parts.

There are two Corollaries to be drawn from hence: *viz.*

Corollaries drawn from theſe Diſtinctions.

In Apoplexies, Deliria's, Convulſions, Lethargies, Malignant Fevers, Small Pox, violent Head-Aches; in ſhort, in all Diſeaſes wherein there's Reaſon to apprehend an Inflammation or Obſtruction in the Veſſels of the Brain, Head, Neck,

Diſeaſes wherein Bleeding in the Foot is preferable;

Arms, *&c.* Bleeding in the Foot gives more Relief than any other.

Where otherwiſe.

On the contrary, it is hurtful, and even pernicious, in all Obſtructions in the *Abdomen*, eſpecially in Diſeaſes cauſed by the Obſtruction of the Glands there.

Contrary Opinion refuted.

I am well aware, that this Opinion has been contradicted by ſeveral Phyſicians. For my own Part, I can with Truth affirm, that I've never obſerved any other Effect from Bleeding in the Foot, in Inflammations of the *Abdomen*, than that of Diminiſhing the Volume of the Blood in general; Which cannot reach theſe Caſes.

Bleeding in the Foot never effectual in Inflammations of the lower Parts, till after often Bleeding in the Arm, and the Uſe of diluting Medicines.

Beſides, I have obſerved, if ever it did ſucceed, 'twas only when it came after repeated Bleeding in the Arm, and the Uſe of diluting Medicines; that is to ſay, when the Inflammation was in a Manner ſuppreſs'd. Its Effect then was that of *Derivative* Bleeding, the moving and carrying off the Blood obſtructed in the Veſſels.

Exceptions authoriſing Bleeding in the Foot in Diſorders of the Inferior Parts.

I own, that Bleeding in the Foot hath a good Effect in ſome Caſes, wherein the *Abdomen* and *Thorax* appear to be over-charged. But this can only be, when there is no real Inflammation; before the Blood is actually got into the Lymphatic Veſſels; and when the

Symptoms are chiefly owing to the Veſſels of the Head being oppreſs'd.

In Obſtructions in the Lungs, cauſed by the Veſſels of the Head being oppreſſed.

Thus in Difficulties of Reſpiration and Obſtructions of the Lungs (ſuppoſing theſe Accidents to depend on the laſt mention'd Cauſe) we muſt always have recourſe to Bleeding in the Foot. For, in this Caſe, the Lungs, which are to be relieved, are not really ſeiz'd with an Inflammation.

In Obſtructions of the *Abdomen* from the ſame Cauſe.

Bleeding in the Foot is of no leſs Advantage in Obſtructions of the *Abdomen*, which are not Inflammatory. Though the Belly is inflated, ſwell'd, tenſe, and even full of Pain, it does not follow that it is actually inflamed. The Symptoms, which may occaſion this Suſpicion, do in reality proceed from an Obſtruction in the Lymphatic Veſſels of the Head; Theſe being diſtended, compreſs the Glands of the Brain: This Compreſſion hinders the Spirits from flowing and being diffuſed in ſufficient Plenty throughout the Organs of the *Abdomen*, and conſequently, theſe laſt, muſt needs loſe their Force and Action. The obſtructed Fluids overcharge the Veſſels, and inflate theſe Parts. Moreover, the Humours contain'd in the Cavity of the Inteſtines, which are now deprived of their Periſtaltic Motion, dilate them extremely through their too briſk Fer-

Symptoms, which only ſeem to denote an Inflammation.

mentation. A State very different from that of a real Inflammation: That is eaſily diſtinguiſhed by the Intenſe Heat, and Acute Pain inſeparable from it, but not at all felt in theſe Oppreſſions we have been deſcribing. What is peculiar to them, as well as to thoſe of the *Thorax*, is, That they are almoſt conſtantly attended with Light-headedneſs, or Drowſineſs.

Symptoms which do really denote one.

Another Exception in Inflammations of the *Matrix*, not conſiderable, and without a *Scirrhus*.

Bleeding in the Foot is alſo practiſed to good purpoſe (but for a different Reaſon) in Inflammations of the Womb; provided they are not too conſiderable, and that the Obſtruction of the Glands has not formed a *Scirrhus* there; for though the *Uterus* be contained in the *Abdomen*, it is, nevertheleſs, poſſeſs'd of ſome peculiar Veſſels, by the Help of which, the Blood may be diſcharged through the Cavity of that Part itſelf: An Advantage the other Parts of the *Abdomen*, ſuch as the *Liver*, *Spleen*, *Kidneys*, and *Inteſtines*, are not favoured with.

Why Bleeding in the Foot is not prejudicial in this Caſe.

But always ſo when the Inflammation is conſiderable.

How favourable ſoever this peculiar Frame of the *Uterus* may be, yet if we diſcover a violent Inflammation there, or inveterate Obſtruction in its Glands, we are of Opinion, it cannot but be dangerous to attempt a Cure by Bleeding in the Foot.

There occurs another Objection, uſually made againſt the Sentiment I have embraced.

Laſt Exception. Fits of the Vapours.

*In Fits of the Vapours*, when the Belly is often Swoln, Tenſe, and full of Pain, *Bleeding in the Foot*, which, in this Caſe, muſt be looked upon as Derivative, *is what* (ſay they) *produceth the moſt Salutary Effects*. We own it; but was there an Inflammation in the Caſe, it would have a quite contrary Operation.

Proofs of this Exception.

To conceive the Reaſon of its Efficacy, in the different Symptoms occaſioned by the Vapours, we muſt trace this Evil to its Source.

Two Cauſes of the Ordinary Symptoms.

The Convulſive Motions; the Stiffneſs of the Muſcles and Tendons; the *Deliria*; the Drowſineſs; the Difficulty of Reſpiration; the Tenſion of the Belly; the Swoonings, and other Symptoms of this Fantaſtic Diſeaſe, can only be aſcribed to Two Cauſes.

Firſt, An Obſtruction in the Brain.

The one is an Oppreſſion in the Veſſels in the Brain. While theſe are overcharged, it often happens, that the Spirits are hindered from being ſeparated. Sometimes in their irregular Eſcapes, they flow out with Fury and Rapidity, which produces that variety of Symptoms. No wonder then that Bleeding in the Foot ſhould be convenient in this Caſe, ſince it is ſo proper to relieve and take off the

Why Bleeding in the Foot helpful in this Caſe.

Oppreſſion of theſe Veſſels, whence all the Diſorder proceeds.

Second, Irritation of ſome Parts in the *Abdomen*.

The other Cauſe of the Vapours is, An Irritation, or Diſtention of ſome Parts of the *Abdomen*. Hence ariſe Convulſions, which reſtrain and diſorder the Courſe of the Blood and Juices: Then is the *Lympha* ſtopt in its Veſſels, and the Blood detained and obſtructed in its own: Its Motion is in no-wiſe brisk enough to give any Apprehenſion of its forcing a Way into the Lymphatic Arteries: Bleeding in the Foot cannot, therefore, fail of Succeſs on this Occaſion; it ſets the Blood at Liberty; it cauſes a more abundant Influx of it into the Parts, and reſtores Motion to the obſtructed Fluids. Conſequently, the Circulation becomes more free, and the Elaſtic Power of the Solids, being re-eſtabliſhed, diſſipates their Convulſive Tenſion.

Why Bleeding in the Foot uſeful here likewiſe.

No Reaſon to fear, that Bleeding in the Foot ſhould cauſe an Obſtruction in the Blood-Veſſels.

We need not on this Occaſion apprehend any Danger of the Blood Veſſels, whether Veins or Arteries, being obſtructed; for the Arteries divide into ſuch a vaſt Number of Ramifications, that the Cavities of theſe taken together, by far exceed the Cavity of the Trunk whence they ariſe. As to the Veins, their Capillaries ſtill widen as they go on; ſo that the Blood cannot flow, but out of a ſtraiter Paſſage into a wider;

whence it follows, That no Derivative Bleeding can add to an Oppreſſion which lies wholly upon the Blood Veſſels.

Bleeding there very dangerous, when the Lymphatic Arteries are too much dilated.

But it cannot fail of proving pernicious when the Lymphatic Arteries are very much dilated, and when the Blood, fermenting too briskly, is likely to force, or has already forced into their Orifices. Theſe Veſſels are too fine and ſlender to reſiſt its Impulſe; they will not be able to ſuſtain it, without being diſtended to a certain Degree; ſometimes ſo far as to burſt. The Blood and *Lympha*, will be extravaſated between the Membranes which ſupport theſe Veſſels, and will quickly cauſe a Suppuration in the Part, or a total Inflammation, always dangerous, frequently mortal.

General Conſequence deduced from theſe Principles.

We conclude, therefore, from the Principles here laid down, *That in Diſeaſes, where an Inflammation is either felt, or ſo much as feared,* Revulſive *Bleeding is inconteſtably to be preferred to* Derivative.

Recapitulation of what has been ſaid concerning Acute Diſeaſes, and their Remedies.

This is the Sum of what I deſigned to eſtabliſh, relating to the Theory of Acute Diſeaſes in General; and the general Remedies applicable to them. It may not, perhaps, be amiſs to place in one Summary View, the moſt important Articles of my Diſcourſe.

*The*

*Article* I. The Seat of Fevers.

*The Seat of Fevers is always in an Humour* contained in the Lymphatic Part of the Blood.

*Article* II. Whence proceed Continued and Intermitting Fevers.

*The Diſſolution of that Humour*, interrupted, or continual, cauſes Intermittent, or Continued Fevers.

*Article* III. Cauſe of greater, or leſs Heat.

*The greater or leſs Heat of all Fevers*, depends upon the greater or leſs Quantity, or upon the quicker or ſlower Diſſolution of that Humour.

*Article* IV. Whence the Difference of Intermitting Fevers.

*The Difference of Intermitting Fevers* ariſes from the different Qualities of this Humour, according as it requireth more or leſs Time for its Digeſtion, or Diſſolution.

*Article* V. Cauſe of the conſtant Duration of Continual Fevers.

*The conſtant uninterrupted Duration of Continual Fevers*, is owing to the Continual Diſſolution of this Humour. Their greater or leſs Violence muſt be aſcribed to the Quantity diſſolved at one Time.

*Article* VI. Different Denomination of Acute Diſeaſes, whence to be derived.

*Peripneumonia.*

*Inflammatory Fever of the Abdomen.*

*The different Denominations of Acute Diſeaſes*, muſt be taken only from the different Parts that are inflamed. When the Inflammation, always attended with a Fever, falls upon the Lungs, the Diſeaſe is called, *A Peripneumonia.* When upon the Inteſtines, *A Fever with an Inflammation in the Abdomen.* Laſtly, When it is thrown upon any other Part, the Diſeaſe is ſtyled, *A Fever with an Inflammation in this* or *that Part.*

*Inflammatory Fever upon the Brain.*

Thus we have thought we might juſtly give the Name of *an Inflammatory Fever upon the Brain*, to that which is attended with an Inflammation in that Part; for, as we have remarked, 'tis in an improper Senſe, that ſome Phyſicians ſtyle it *Malignant*.

*Article* VII. Different Eruptions upon the Skin conſtitute the ſeveral Species of Malignant Fevers.

*The different Species of Malignant Fevers*, are determined by their different Eruptions upon the Skin; of which take the following plain Inſtances.

Symptoms of the *Meaſles*.

If the Humour obſtructed in the Glands of the Skin be very fine and ſubtil, it forms that Sort of *Eriſipelatous Inflammation*, which we call the *Meaſles*.

Of the *Small-Pox*.

If the Venom is of a more fixed and groſs Nature; if it cauſes certain ſmall Puſtles to ariſe, which afterwards ſuppurate; this Diſeaſe takes the Name of the *Small-Pox*.

Of a *Scarlet-Fever*.

Sometimes the Glands of the Skin are not viſibly obſtructed; but only the Lymphatic Veſſels very much dilated, by the Blood having violently entered into them. Then appear Spots on the Skin, whoſe Reddiſh Colour, gives this Diſeaſe the Name of a *Scarlet Fever*.

Of a *Peſtilential Fever*.

It happens, that the Humour incraſſated to a great Degree, over and above the Fever, produces likewiſe Obſtructions in the Glands of the Arm-Pits, in thoſe of the *Anus*, or in the *Parotides*, breaking out in Tumours like *Bubo's*; theſe Symptoms denote *a Peſtilential Fever*, or *Plague*, properly ſo called.

*Article* VIII. Primary Cauſe of different Diſeaſes.

There remains *one important Obſervation* to be made, relating to theſe ſeveral Diſeaſes. The Primary Cauſe of each, is the *Homogeneouſneſs* of the vitiated Humour contained in the *Lympha*, with that which is ſecreted in the Glands of the affected Part.

Principles to be recollected concerning the Uſe of Purges in Fevers.

It muſt be remembered, that after having given a Detail of the different Species of Fevers, we ſhewed the *Neceſſity of Cathartics*, and the *Precautions* which are to be obſerved in the Uſe of them.

Concerning Inflammations.

We have proved, That an *Inflammation proceeds from the Irruption of the Blood* into the Lymphatic-Veſſels. We have ſhewed how neceſſary it is *to have recourſe to Bleeding*, in order to prevent an Inflammation.

Choice of the Two Sorts of Bleeding. Of the Time: Of the Quantity.

And, laſtly, we have examined *the Reaſons* that are to determine our Choice *of this, or that Sort of Bleeding*; whether *to delay*, or *haſten it*; whether *in greater*, or *leſſer Quantities at a Time*.

We now come to treat of the Cauſe of *Chronical Diſeaſes*.

OF

# OF
# *Chronical* DISEASES.

## *Of the* Structure *of the* Glands.

Chronical Diſeaſes ariſe from Obſtructions in the Glands.

IT is generally agreed, That theſe Diſeaſes do all of them ariſe from Obſtructions in the Glands of the ſeveral Parts. It is, therefore, impoſſible to be exactly skilled in them, without having formed a right Notion of the Structure of theſe Glands. This is ſo very obſcure, that hitherto there has ſcarce been Reaſon to hope a perfect Diſcovery of it from Anatomy.

Opinion of ſome Authors concerning the Structure of the Glands.

Authors, who have treated on this Subject, have looked upon a Gland as nothing but *an open Body*, or *Tube*, thro' which a certain Liquor is ſeparated from the reſt.

Thought by ſome to be Spongy or Veſiculary-Bodies, in which the Blood leaves the Humour which is to be Secreted.

Several have imagined a Gland to be a *Spongy* or *Veſiculary Body*; that an Artery terminates there; and that the Blood convey'd by that Artery into this Spongy Contexture, or into the Cavity of the Veſicles, immediately leaves there one certain Humour, rather than another, to be received into the Secretory Veſſels, which open into the ſame Place.

Objections to that Opinion.

But having examined theſe Glandulous Bodies very carefully, I have never found any thing there, any more than ſome other Anatomiſts, but irregular Windings and Complications of *Lymphatic* and Blood-Veſſels.

Not poſſible a Sanguinary-Artery ſhould filtrate the Humour.

Beſides, I have never been able to conceive *how a Secretory Veſſel of a Gland, could immediately receive from an Artery,* (as hath been hitherto ſuppos'd) *the Liquor which was to be ſeparated.* The Juices flow in this Artery all in one mix'd Maſs, and are hurry'd on with too rapid Speed for any ſuch Separation.

The Blood's Motion there too impetuous.

For one and the ſame Liquor conſtantly to filtrate thro' the ſame Veſſels, there is neceſſarily required a ſlower, gentler, leſs impetuous Motion, than that of the Fluids in the Sanguinary-Arteries. Wherefore I have concluded, that no ſuch filtrated Liquors could iſſue from theſe Veſſels. I have indeed conſider'd, that the various Complications of the Sanguinary and *Lymphatic*-Veſſels, might ſomewhat moderate the Impetuoſity of the Blood: Yet ſtill that muſt be too brisk and tumultuous to allow a conſtant laſting Filtration.

How to form a clearer Idea of the manner of Secretions.

Surrounded with theſe Difficulties, I have ſtill imagined, it was poſſible to form a more juſt and clear Idea of the Structure of the Glands: That this was to be done by ſupplying what Anatomical Obſervations have not hitherto been able to diſcover; viz. *By ſuppoſing that the Secretory Veſſels ariſe from the Lymphatic Arteries, as theſe laſt do from the Blood-Veſſels.* This being admitted, it will be eaſy to explain, in what manner the Liquors contain'd in the *Lympha*, may filtrate conſtantly through the ſame Veſſels.

By ſuppoſing the Secretory Veſſels to ariſe immediately from the *Lymphatic* and not from the Sanguinary-Arteries.

Reaſons ſupporting this Opinion.

The *Lymphatic* Arteries no leſs complicated and tortuous than the Sanguinary

But leſs Elaſti

For the *Lympha*, when once it has enter'd its own Arteries, muſt have its Courſe immediately check'd; ſeeing that theſe Veſſels have as many Windings and Turnings, as thoſe of the Blood, but a far leſs Elaſticity. The Fluids therefore, in the *Lympathic*-Veſſels, muſt move very ſlowly. In their Paſſage they meet with the Orifices of the Secretory Ducts, which terminate there, and which contain a particular Liquor. If this Liquor, which they there meet with, is *Homogeneous* to them, it is eaſy for them to enter into the containing Tube and mix with it; if otherwiſe, they ſtill flow in their own Veſſels.

Guided by this Structure, we ſhall be able to explain the Mechaniſm of all Secretions.

* Vid. Meth. de l'Acad. R. des Sciences, for 1711. Page 245, *&c.*

We conceive *the * Subſtance of a Gland*, to be nothing elſe, but a Complication of Sanguinary and *Lymphatic*-Veſſels.

New Theory of the Structure of the Glands.

*Theſe laſt*, which ariſe from the others, are, as it were, the Reſervatory of all the *Lymphatic-Fluids.*

*The third Sort of Veſſels*, which we have call'd *Secretory*, ariſe from the Windings and Turnings of the *Lymphatic*-Veſſels. *They will admit* but one particular Liquor, *Homegeneous* to that which they themſelves contain; and this they will diſcharge into a fourth Order of Veſſels, nam'd *Excretory.*

*Whence again* the Fluid is often diſcharged into other Cavities, where theſe laſt empty themſelves; according as the Parts are to which it is convey'd.

Simplicity of this Structure, and its Conformity with the Ordinary Diſpoſition of the Veſſels.

This *Idea* of the Structure of the Glands is very Simple; beſides, it is exactly conformable to the eſtabliſh'd Order of Nature. For is it not the ſame with what ſhe has been pleas'd to obſerve in the uniform Diſpoſition of the ſeveral Veſſels, which ſhe has united to each other; and in that of ſuch Excretory Veſſels themſelves,

ſelves, as are the moſt conſiderable and eaſie to be diſtinguiſh'd?

Supported by the Opinion of Anatomiſts.

All Anatomiſts acknowledge the *Lymphatic* and Blood-Veſſels to be interwoven with each other. They have eſtabliſh'd Secretory Veſſels in the Glands. What neceſſity then of ſuppoſing, or admitting, without any ſolid Foundation, any other Organs for filtrating the Juices? A few Secretory Ducts, placed amidſt the Convolutions of the *Lymphatic*-Veſſels, will be ſufficient for the whole Mechaniſm. 'Tis to be wiſh'd indeed, that this new Theory of the Structure of the Glands, was confirm'd by a Train of Anatomical Obſervations. Hitherto, at leaſt, there has not any Structure been diſcover'd, more eaſy to be conceiv'd, or more adapted to its Ends. We therefore hope this will be approved, on account of its Simplicity, and the Analogy it bears with the Ordinary Operations of Nature, in the Organization of the Veſſels which ſhe has united to each other.

Why to be admitted, tho' not yet confirm'd by Anatomical Obſervations.

Objection to this Theory.

It will no doubt be objected, that the Structure obſerv'd in ſome particular Glands, cannot be reconciled with what we have aſcribed to all the Glands in general.

Anſwer.

But an eaſy Anſwer may be return'd to this. It will be ſufficient to ſhew,

That

That the Differences, which have been taken Notice of in the Glands, do not depend upon the different Structure of the Organs, that are concern'd in the Filtration of the Humour; but of thoſe, which are appointed to convey the Liquor, when ſeparated, to the ſeveral Parts.

Structure of ſome particular Glands Examin'd.

To clear up this Difficulty, let us take a View of ſome of the moſt remarkable and beſt known Glands. We will begin with the *Liver*.

Obſervations upon thoſe of the Liver.

It is commonly thought that the Veſicles, which are found in this Part, are the Glands, or Organs by Means of which the Bile is ſeparated from the Blood. Mr. *Chirac* has conceiv'd this Filtration to be perform'd in the following manner.

Mr. *Chirac*'s Opinion concerning theſe, in a Letter to Mr. *Tournefort*.

*Three ſeveral Veſſels* open into each Veſicle of the Liver; a Sanguinary Artery, and Vein, together with a Secretory Veſſel of the Bile.

*Theſe Veſicles*, after having been dilated by the Blood which the Artery has convey'd into them, contract by their own Elaſticity, and force out that Fluid.

*The Blood* thus impell'd, is carry'd off by the Vein, which opens into theſe ſame Veſicles; but the *Bile* paſſes off by itſelf, thro' a Secretory Veſſel ariſing thence.

Objection to this Mechaniſm.

This Mechaniſm, tho' very ingenious, and ſupported by the Authority of a very Learned Man, yet does not appear to be confirmed paſt diſpute: For who hitherto has ever been able to ſhew the Orifices of theſe Arteries, Veins, and Secretory Veſſels, which are ſaid to open into the Veſicles?

Mr. *Winſlow*'s Diſcovery of the innumerable *Papillæ* on the Inſides of the Veſicles.

Vid. Mem. de l'Acad. R. or 1711, p. 245. &c.

When we view attentively the Inſide of theſe Veſicles, we perceive, along with Mr. *Winſlow*, the firſt Author of this Diſcovery, that they are lined with a kind of Down, form'd by the Extremities of a prodigious Quantity of exceeding ſmall fine Veſſels opening into theſe Cavities.

Reſemblance between the Veſicles of the Liver, and the Gall-Bladder.

Such another Down is found in the Gall-Bladder, and there likewiſe we find an infinite Number of ſmall Veſſels. But we perceive none capable of receiving and filtrating all the Bile, which is collected here. Now the Veſicles of the *Liver*, and this Veſicle of the *Bile*, are nearly of the ſame Structure. We hardly obſerve any other Difference between them, than that of their Capacities. They are equally appointed to ſeparate the Bile. Have we not therefore Reaſon to believe, that this Filtration is perform'd by one and the ſame Mechaniſm, in the Veſicles of the *Liver*, and in that of the *Bile* itſelf? Permit me then to give my

Equally appointed for the Secretion of the Bile.

own Opinion, or (if you pleaſe) Conjectures, upon this Subject.

Neither of them the Glands of the Liver.

Neither the Veſicles of the Liver, nor the Gall-Bladder, are to be look'd upon as the Glands of that Part; but as a Sort of Receptacles of the Bile.

The *Papillæ* are the Extremities of the Secretory Veſſels.

*The Downy Lining, or Papillæ*, diſcovered by Mr. *Winſlow, are nothing but the Extremities of the Secretory Veſſels*, which likewiſe may paſs for Excretory; for theſe convey the Bile into the Gall-Bladder, and into the Veſicles of the Liver, in the ſame Manner, as the Excretory Veſſels of the Glands of the Kidneys convey Urine into the *Papillæ* of that Part, before it falls into the *Pelvis*.

The proper Glands of the Liver.

The proper Glands of the Liver, are the Plexus's of the Sanguinary and Lymphatic Veſſels, which paſs into it.

Uſe of the Veſicles.

The Veſicles are only Cavities to receive the filtrated Liquor. Afterwards it flows through the Excretory Ducts of theſe Veſicles into the *Pori Bilarii*, which are the Common Excretory Veſſels of the whole Liver.

*The ſeveral Branches of theſe unite in one Trunk*, which receives an Excretory Veſſel of the Gall-Bladder, called, *Ductus Cyſticus*. Theſe together form the *Ductus Communis Choledochus:* which, at the ſame Time, conveys into the *Duodenum*, the

Bile tranſmitted from the Veſicles of the Liver, and that from the Gall Bladder.

Uſefulneſs of this Structure.

This Structure is the moſt uſeful that could poſſibly have been contrived, nay, 'tis abſolutely neceſſary, to compleat the Digeſtion of the Aliments. For it is during the Time of Digeſtion, that the Bile ought to flow in the greateſt Quantity into the *Duodenum*, in order to mix there with the groſs Chyle as it comes out of the Stomach, and to put, as it were, the finiſhing Hand to it. This could not be done, if there were not always a certain Quantity of it kept in Reſerve, and ready to flow in upon this Occaſion. It was neceſſary therefore, that during the Intervals of Digeſtion, there ſhould be Time for the filtrated Bile to be collected into a particular Receptacle. It may notwithſtanding conſtantly flow into the Inteſtines; but that, in all Appearance, muſt be a very ſmall and almoſt inſenſible Portion of it, which does ſo. The greateſt Part muſt remain in the Veſicles of the Liver and the Gall-bladder; 'till the Aliment is taken in. Then the Stomach is extended; is put in Motion, and gently preſſes one Part of the Liver againſt the Ribs and *Diaphragm*. A while after the Inteſtines likewiſe ſwell, and compreſs the other Part of the Liver. So that this double Preſſure, though per-

A Collection of Bile neceſſary to compleat Digeſtion.

Uſe of the Veſicles of the Liver. They are Receptacles of the Bile.

How the Bile is forced out of its containing Veſicles.

formed without any Violence, neceſſarily ſqueezes out the Bile contain'd in the Veſicles. It protrudes it in a conſiderable Quantity into the *Duodenum*, where it has the chief Influence in the ſecond Digeſtion.

Their Analogy with the Gall-Bladder.

Hitherto this Uſe of the Veſicles of the Liver hath not been plainly ſhewn by Anatomy. But this is evidently that of the Gall-bladder, where there is always a Quantity of Bile ready filtrated. Why ſhould not then the Veſicles of the Liver have the ſame Office with that, ſince their Structures are ſo exactly alike?

Obſervations upon the Glands of the *Pancreas*.

Let us now examine the *Pancreas*. Throughout this Part we find nothing but a ſurprizing Collection of Sanguinary and Lymphatic Veſſels. Theſe, interwoven with one another, form the *Small Glandulous Conglomerations*, from which we perceive ſeveral conſiderable Excretory Veſſels, which diſcharge themſelves into the common Excretory Duct of the whole *Pancreas*.

*Idea* we ought to have of this Part.

To form a more perfect *Idea* of this Part, it will not be enough to obſerve its Sanguinary, Lymphatic, and Excretory Veſſels; but we muſt likewiſe conceive Secretory Ducts ſituate among the Circumvolutions of the Lymphatic Veſſels.

This *Idea* is ſo much the more exact, in that it is conformable to the Connection of the Sanguinary and Lymphatic Veſſels; and to that of the Excretory Veſſels with one another.

Obſervations on the *Parotid* Glands. Theſe form'd by a Number of Veſſels taken for Lymphatics.

As to what concerns the *Parotid Glands*, they are principally form'd by a very great Number of Veſſels, which in Appearance are Lymphatics.

Theſe all diſcharge themſelves into the *Salival Duct*, which is the common Excretory of the whole Gland, opening into the Mouth.

What they ought to be eſteemed.

Secretory Veſſels where the *Saliva* is collected.

*Our Opinion* is, That theſe Veſſels, which are taken for Lymphatics, are Secretory Veſſels, fill'd with *Saliva*, in order to emit it into the Mouth during the Time of Maſtication. All the World knows, that then a very large Quantity of it flows in, and that it is of the greateſt Uſe for Digeſtion. It is true, the niceſt Inſpection has not yet been able to diſcover in theſe Glands, either Veſicles or Cavity, for the *Saliva* to be collected in.

Reaſons for this Opinion.

How the *Saliva* flows into the *Ductus Salivalis*.

But may not the prodigious Number of theſe Veſſels ſupply that Defect? May not they themſelves ſerve as a Reſervatory? For, it is evident, That but little *Saliva* flows into the *Salival Duct*, when there is no Stimulation in the Mouth, and when the lower Jaw is not moved. On the contrary, When the Motions of that are frequent (as in Maſtication) the Veſſels of the *Parotid Glands* being compreſs'd, furniſh the Mouth with *Saliva* in very great Plenty.

Inſtance in the Milk of the Breaſts.

Obſervations upon the Glands of the Kidneys.

In the ſame Manner, the Veſſels ariſing from the *Mammellary Glands* keep the Milk as it were in Reſerve, and never emit any Quantity of it, but when thoſe Glands are compreſſed, and when the Infant ſucks. Come we now to the Structure of the *Kidneys*, whoſe Office is to filtrate the Urine. A great Number of Parts are deſtined to the Separation of this Fluid.

White Capillaries diſcover'd by Mr. *Winſlow*.

Theſe not for the Secretion of the Urine; but plain Excretory Ducts.

After having paſs'd through the Glandulous Subſtance, it flows into thoſe long, white, capillary Tubes, of which * Mr. *Winſlow* was the firſt who gave the Deſcription. I will not diſpute with that skilful Anatomiſt about the Name of theſe Veſſels: I value my-ſelf upon having been his Scholar: But I cannot agree with him, that they ſerve to ſeparate the Urine from the Blood. I take them to be evidently nothing but Excretory Ducts, into which the ſmall Excretory Veſſels of the Glandulous Kernels empty themſelves as into a common Canal. Their Length and Situation naturally leads us to this Notion. Indeed, ſeveral of theſe Veſſels unite in the *Carunculæ Papilares*, whence the

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* In a Paper, read before the *Academy* of Sciences, and inſerted in their Regiſters in 1712.

Urine deſcends into a Cavity named *Pelvis*.

Courſe of the the Urine from the *Mamenella Renales.*

After this 'tis carry'd by a Canal called *Ureter* into the Bladder, which is its Receptacle; and laſtly, It iſſues by another Tube named the *Urethra*; which may be look'd upon as the laſt Excretory Duct of the Kidneys.

How the Glands of the Kidneys differ from others.

This Deſcription ſufficiently ſhews, That theſe laſt mention'd Glands differ from others only in the Number and Diſpoſition of their Excretory Veſſels.

Difference of the *Uterine* Glands from others.

We ſhall not need to enlarge upon the Glands of the *Uterus*, nor on thoſe of the Stomach. All that we find particular in them, is, That the Excretory Ducts of the Uterine Glands open into the Cavity of that Part; and that thoſe of the Stomach terminate in a Sort of Veſicles or Bags. Anatomy ſhews us ſeveral Inſtances of this laſt Sort of Cavities in Animals, particularly in Birds.

TheſeDifferences conclude nothing againſt the *Idea* given of the general Structure of the Glands.

What then is the Reſult of theſe Obſervations concerning the Structure of the principal Glands in the Body? Here is nothing that can deſtroy, or ſo much as furniſh one Objection againſt the Simple *Idea* we have given of the Structure of the Glands in general. All the Difference that occurs, is what regards their Common Excretory Veſſels. This makes

No Difference but in their Excretory Veſſels, which does not affect the Mechaniſm of Secretions.

makes no Alteration in the uniform Manner of Secretion. In all Sorts of Glands we equally find the Sanguinary and Lymphatic Veſſels interwoven with each other. We often diſcover the firſt Excretory Ducts. Sometimes, indeed, we confeſs, they are found differently ſituated. But as for the Veſſels which we think compoſe the Subſtance of the Gland itſelf, 'tis probable their Union is the ſame in all Glands whatever.

**Miſtake of ſome Anatomiſts about the Glands.**

This Difference of Situation, which is found in the laſt Excretory Veſſels of Glands, is of much leſs Importance, than has been commonly imagined. It has nevertheleſs led many Anatomiſts into a Miſtake. They thought they had Authority enough to beſtow the Name of *Glands* upon certain Parts, when they perceived ſome Liquor to iſſue from thence. And yet theſe *Pretended Glands* are often nothing but the Cavity or Receptacle where the Filtrated Liquor is laid up.

**Cavities containing any Fluid, miſtaken for Glands.**

**Theſe only Receptacles.**

Theſe Cavities are ſometimes placed at a good Diſtance from the Glandulous Bodies. If theſe deſerve the Name of Glands, the ſame may be, with equal Reaſon, beſtowed upon the *Ductus Choledochus*, and Gall-Bladder, upon the *Ureters*, Urinary Bladder, and *Urethra*. For

**Inſtances of this.**

do not each of theſe Cavities equally ſerve to collect, and diſcharge, the *Bile*, or the *Urine*?

Not that the Authors who have fallen into theſe Miſtakes, are altogether inexcuſable. The Glandulous Bodies are often too minute to be plainly diſtinguiſh'd. The moſt evident Token, whereby to judge that a certain Part is a Gland, is the Efflux of ſome particular Liquor from thence. Tho' this is not ſufficient to aſſure us that the Part is really ſuch, at leaſt it will ſerve to ſhew that there are ſome Glands either there, or not far of.

Glands hard to be diſtinguiſh'd by Reaſon of their Minuteneſs.

Efflux of a Liquor from a Part, does not prove it to be a Gland.

But then we muſt take Notice, that many Glandulous Bodies afford no Liquor in them after the Death of the Animal, eſpecially when they have been dried, when preſs'd, or bruiſed, or after they've been macerated in Water.

Glands having no Liquor in them after Death.

The Sum of what has been ſaid, amounts to this.

Subſtance of the whole Diſcourſe concerning Glands

*Glands* are nothing elſe but a Complication of Sanguinary and Lymphatic, of Secretory and Excretory Veſſels.

Nothing but a Complication of Veſſels.

*The Secretory Veſſels* do not ariſe immediately from the Blood-Veſſels, but from the Lymphatic; and they may perform the Office of Excretory Veſſels, thro' their Extremities oppoſite to their firſt Orifices.

Secretory Veſſels ariſe from the Lymphatic, and may likewiſe be Excretory.

*Laſtly*,

Glands differ only in the Structure and Situation of their Excretory Veſſels.

*Laſtly, all the Differences* obſerved in Glands, are only to be attributed to the various Diſpoſitions and Structure, which Nature has ordain'd in their apparent Excretory Veſſels, to facilitate the Functions of the ſeveral Parts.

From the Structure of the Glands we will paſs to the Mechaniſm, by which all the Fluids, contain'd and mix'd confuſedly in the *Lympha*, are obliged to filtrate each of them, conſtantly and ſeparately, through one certain Part.

## *Of the* MECHANISM *of* SECRETIONS.

THERE have been various Opinions concerning the Cauſe of Secretions.

First Opinion concerning Secretions.

Some have imagined, *That every Gland contains a peculiar Humour, which they call a Leven, or Ferment; and which, they ſuppoſe, communicates its Quality to all the Fluids which enter the Gland.*

In this manner (ſay they) the Blood flowing into the Liver, is changed into Bile, of which before it had none of the Qualities. This Opinion is not to be maintain'd, and has been fully confuted by Dr. *Pitcairne* *.

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* Diſſert. de Circulatione Sanguinis per Vaſa Minima. § 5. &c.

Without ſtaying to urge the ſeveral Arguments in Oppoſition to it, it will be ſufficient to alledge two Anatomical Obſervations which abſolutely deſtroy this Notion.

Confuted by two Obſervations.

First Obſervation.

Take a Dog, and tie the two *Emulgent Arteries* that carry the Blood to the Kidneys: No Part of that Fluid will be able to paſs into theſe Glands. There will not be any that can ſo much as come to their Capillary Arteries. In the mean Time the Dog will be tormented with Vomitings; and the Humour thrown up will ſend forth a ſtrong Urinous Smell; it muſt therefore contain Urinous Particles. Now 'tis certain none of this Humour can have paſs'd into the Kidneys. We may then fairly conclude, that theſe Urinous Particles have a real Exiſtence in the Blood before they arrive at the Kidneys.

Proving Urinous Particles actually in the Blood, which never came at the Kidneys.

Second Obſervation,

When the Liver is Scirrhous, and its Glands obſtructed, it is abſolutely impoſſible for the Blood to filtrate through it. In this State, 'tho' the Scirrhous Part of the Liver is neither yellow, nor tinged with Bile, we nevertheleſs ſee that Colour diffuſed over all the reſt of the Body, and the Urine tinged with it. The Inference is, the Bile was actually form'd and contain'd in the Blood, before it reach'd the Glands of the Liver.

Proving Bile in the Blood before it comes at the Liver.

Theſe two Experiments, which might be ſupported by many others, are ſufficient to ſhew where the ſeveral Fluids in different Parts of the Body, do contract their peculiar Quality. They make it evident, that theſe Qualities muſt be acquir'd in the Blood, antecedent to any Filtration through the Glands; ſo that they in no wiſe depend upon a peculiar Humour or Leven contain'd in each of thoſe Parts.

**Second Opinion.**

*A ſecond Opinion* concerning Secretions, is, *That the Humours form'd in the Blood, are ſeparated by Means of the different Configurations of the Pores, or Orifices of the Secretory Veſſels.* So that a Circular Orifice can only filtrate Spherical Particles, and ſo for the reſt.

***Pitcairne's*** **Reaſons overthrowing it.**

Dr. *Pitcairne* to overthrow this Theory, makes uſe of the following Arguments.

" There would be no hindering (ſays " he) the finer Fluids from paſſing thro' " the Pores, which ſeparate the thicker " and groſſer Humours. Of how irregular a Figure ſoever the Particles of " any Liquor are, yet if their Diameter " be leſs then that of the Orifice of a " Veſſel, be its Figure what it will, the " Fluid will enter without Difficulty. " So that the Secretions will be always " diſordered by the Mixture of Liquors

“ of different Natures, and conſequently
“ render'd imperfect.

This Objection is a very ſolid one. But it is amazing this Learned Gentleman ſhould himſelf fall under the Difficulties, he has objected to the Defenders of this ſecond Opinion. This is his Caſe, when he comes to give us his own; which we ſhall make the *Third* to be treated of.

According to him *, *Not the different Figures, but the different Magnitudes of the Orifices, or Pores, are the Cauſes of different Secretions.*

Third Opinion.
* Differtat. de Circulatione, &c. § 15. &c.

In this Hypotheſis, what can hinder the ſmaller Particles from entering the larger Orifices? He in vain endeavours to ſalve this Inconvenience, by alledging *; “ That the Number of the Con-
“ globate Glands, far exceeds that of
“ the Gonglomerate. Wherefore (ſays
“ he) the finer Fluids, which are always
“ ſeparated by the Glands of the firſt
“ Sort, go off conſtantly in much greater
“ Quantities, than the groſs Humours
“ filtrated through the other Glands.

* § 9. &c.

Notwithſtanding this, it will ſtill follow, that the finer Liquors muſt mix with the groſſer in Filtration. Whence, as in the Second Opinion, will ariſe an Imperfection and Irregularity in the Secretions; than which nothing is more contrary to the Order and Simplicity of the Animal Oeconomy.

How much is it to be wiſh'd, that thoſe Learned Gentlemen, who endeavour to explain the Art of Phyſick by Mathematical Principles, wou'd begin with an exact Knowledge of the Structure of the Parts, and of the Springs belonging to the Machine! In vain do they expect to find this in Books. 'Tis not to be acquired but by the frequent Uſe of the *Anatomical Knife*, by many repeated Diſſections.

Fourth Opinion preferable to the reſt.

Having thus rejected theſe three Opinions concerning Animal Secretion, there is a *Fourth*, which we cannot help embracing, as what we judge the beſt founded.

*That Liquors filtrate thro' ſome certain Strainers rather than thro' others, is, becauſe they find thoſe fill'd with a Liquor of a Nature Homogeneous to their own.*

Permit me here to repeat the Experiment already quoted, of a Piece of Cloth dipp'd in Oil, which being again dipp'd into a Veſſel containing Wine and Oil mix'd, will filtrate only the Oily Part, and not ſuffer the Wine to penetrate it.

This Example alone is ſufficient to prove the laſt Propoſition.

*Few Liquors, Oily ones eſpecially, mix exactly with others; becauſe their conſtituent Parts*

*Parts cannot intimately touch and cohere with thoſe of an Heterogeneous Liquor.* This Sort of mutual Contact is impoſſible: For the Situation of their Pores, which only let the fineſt Part of the Air paſs through them, is too different. This Efflux of Air out of one Liquor into another, not meeting with ſuch Pores as thoſe it flow'd out of, ſtrikes againſt the Particles of the laſt, repels and hinders them from uniting with the others. The Obſtacle to their Union, is in Proportion to the Diſſimilitude of their Pores.

Requiſite Diſpoſition for the perfect Mixture of Liquors.

On the contrary, *if the Pores of Two Liquors are diſpoſed in ſuch a Manner as to anſwer each other, their Particles will unite without any Difficulty.* The Subtile Air will paſs without Hindrance out of the Pores of the one, into the Pores of the other; while the groſſer ambient Air preſſeth them on all Sides, and obliges them to unite more intimately. This Mechaniſm of the Union and Diſunion of Fluids, is analogous to Magnetiſm. Preſent one Pole of the Load-Stone to Filings of Steel, it unites with, and keeps them ſuſpended. Turned on the other Side, it repels them.

Reflections compleating the Theory of Secretions.

Before we finiſh this Affair of Secretions, let us add ſome neceſſary Reflections, to give ſtill a farther Light into this Subject.

*All the Veſſels of our Body, even thoſe of the moſt minute Glands, were formed and opened in Ovo.* From the Firſt Moment of their Exiſtence, they muſt have contained ſome Fluid; otherwiſe, their Sides had been flattened, and their Cavity deſtroyed. 'Twas, therefore, according to the Order of Nature, that the Juices contained in the Glands, or Veſſels, were at firſt conſtituted of the ſame Qualities with thoſe which were afterwards to be ſecreted there.

It cannot be denied, but that the Liquors, which flow gently on in the Lymphatic Veſſels, paſs ſlowly by the Orifices of the Secretory Veſſels. Theſe laſt muſt needs contain ſome Fluid, which, according to its different Quality, muſt act differently upon theſe Lymphatic Juices. If it is *Heterogeneous* to them, it will oppoſe their Entrance into the Secretory Duct; it will even repel them. If *Homogeneous*, it will facilitate their Entrance, and attract them. This Mechaniſm is founded upon the following Principles, which we have already demonſtrated.

Principles on which the Theory is founded.

Præ-exiſtence of the Juices in the Blood.

*Upon the Formation and Real Exiſtence* of all the Liquors in the Blood, before they arrive at their proper Glands.

Diſpoſition of Liquors to mix.

*Upon the Facility*, with which Fluids of the ſame Nature unite; *and upon the Immiſcibility*

*miſcibility* of thoſe whoſe Contextures are different.

Each Principle derives its Proof from what paſſes every Day, when we go about to ſeparate Two Liquors mixed with one another.

Conſequence of theſe Principles.

Upon the Strength of ſo many Reaſons, which to us appear inconteſtable, we will make no Scruple *to aſſign, for the Primary Cauſe of the Filtration of all the Juices through the Secretory Veſſels, the Homogeneity of thoſe, which are ſtill in the Blood, with thoſe contained in the Secretory Veſſels.*

The exact Diſcuſſion of this Subject, which we have entered into, and the *Idea* given above of the Structure of the Glands, will be a ſure Guide for us into the Knowledge of Obſtructions there, from whence *Chronical Diſeaſes* take their Birth.

## *Of* Obſtructions *in the* Glands, *the Sources of* Chronical Diſeaſes.

Obſtruction of the Glands, cauſed by the Groſſneſs of the Humour which ſhould ſeparate there.

THE Obſtruction of the Glands depends upon the Humour which ought to filtrate through them. Being naturally fine and ſubtile, when it becomes

That ſtopped in the Secretory and Excretory Veſſels.

too groſs, it can no longer flow with Eaſe in the Secretory or Excretory Veſſels. It will there ſtop, eſpecially in the latter, or will have a leſs Degree of Motion, and will choak them up in ſuch a Manner, that nothing can paſs. After this, all the Homogeneous Humour, which ought to be ſeparated through theſe Veſſels, is forced to remain in the *Lympha*. It inſenſibly unites with it; it wholly alters its Quality; and, by that means, diſorders moſt of the Animal Functions, and chiefly the Digeſtion. Moreover, this confuſed Mixture of the Juices renders them more groſs, and hinders their paſſing eaſily through their ordinary Strainers. There they ſtay, and are damm'd up; whence new Obſtructions in ſeveral Parts.

Homogeneous Humour forced to remain in the *Lympha*.

Alterations which that produces.

Laſtly, A Quantity of the ſame Humour, which ought to have filtrated through the Glands, being detained in the Blood, and unable to go off, gives a greater Saltneſs to all the Juices, and excites a brisker Fermentation, whence ariſes a Slow Fever. The *Succus Nutritius* puts off its Soft and Unctious, and receives a Saline and Cauſtic Diſpoſition. The Solids, which it impairs inſtead of nouriſhing, are waſted and deſtroyed. The Fluids falling into a Total Solution, become incapable of ſuſtaining

Slow Fever.

Exceſſive Saltneſs of the *Succus Nutritius*.

Solids impaired.

taining their ſeveral Functions; from which univerſal Diſorder of the Machine, Death infallibly enſues.

Different Cauſes of Symptoms, more or leſs dangerous.

Obſtructions produce Symptoms more or leſs fatal, and conſequently more or leſs difficult to cure. This Diverſity depends,

I. *Upon the Quality* of the Humour which produces them.

II. *Upon the Part* where they are formed.

III. *Upon the Number of the Glands* that are obſtructed, and the Parts oppreſſed by them.

IV. *Upon the Time when they began*, and the Progreſs they have ſince made.

V. *Upon the more or leſs advanced Age* of the Patient.

Prognoſtics from theſe Symptoms.

The ſeveral *Prognoſtics* to be made from theſe different Symptoms, deſerve to be explained ſeparately.

First Cauſe. Thickneſs of the Humour.

*When the Incraſſation of the Humour is the Sole Cauſe that ſtops it in the Veſſels,* and produces the Obſtruction, *the Cure will be much more eaſy*, than when that Humour is Cancerous, Scrophulous, or Scorbutic; for in theſe laſt Circumſtances, beſides its Thickneſs which retains it in the Glands, we ſhall have its peculiar Ill Quality to contend with.

Second Cauſe. Diſtinction to be made of the Parts obſtructed.

*Every Obſtruction is more or leſs obſtinate according to the Part it ſeizes.* At the beginning, it is eaſy enough to cure one in the Spleen, in the Womb, Liver, *&c.* but is very difficult, though taken never ſo early, to ſubdue thoſe that happen in Glands purely Lymphatic; ſuch as thoſe of the *Meſentery*, *Pancreas*, &c. The moſt obſtinate and terrible of all Obſtructions, are thoſe in the Glands of the *Thorax*.

Third Cauſe. Obſtruction of ſeveral Parts at the ſame Time.

*It ſometimes happens, that the Obſtruction is formed in ſeveral Parts at once.* If it is only in one, as in the Liver, and if it oppreſſeth ſome of the Glands there, or the Excretory Veſſels only, 'twill coſt leſs Trouble to diſſipate it. On the other Hand, it will not be removed without much Difficulty, if it extends to all the Glands of that Part at once, or to moſt of the Secretory and Lymphatic Veſſels which compoſe the Gland; for in that Caſe, the Symptoms will be much more violent, and the Bulk of the Part, will be conſiderably enlarged.

If ſeveral Parts are oppreſſed at the ſame Time, 'tis but rarely we can ſet them free; becauſe the Helps which are proper for ſome, do not at all ſuit others. For inſtance, *Steel*, and other Deobſtruents of the ſame Nature, ſucceed well in Obſtructions of the Liver and *Uterus*; but if, unhappily, the Uſe of them has been neglected at firſt, and a new Obſtruction ariſes in the Glands of the Lungs, the Opportunity of applying thoſe Remedies is then utterly loſt.

With Reſpect to this laſt Part, their Effects will be as dangerous, as they would have been Salutary with reſpect to the other Two.

*The more Inveterate the Obſtruction, the more difficult to remove.* The Reaſon is ſo plain, it needs no Explanation.

Fourth Cauſe. Continuance and Progreſs of the Obſtruction.

Sometimes the Humour is ſo thick, it ſticks like Glue to the Sides of the Veſſels; which is known either from the Hardneſs and Inſenſibility of the Part, or from the long Continuance of the Obſtruction. In this Caſe, the Cure is almoſt impoſſible; it would be imprudent to attempt it; for before the hardened Humour could be diſſolved, we ſhould run the Riſque of throwing all the other Juices into a Total Diſſolution, which would quickly finiſh the Life of the Patient.

Fifth Cauſe. Age of the Patient.

*In Youth*, when the Juices are more Fluid, and leſs Salt, *Obſtructions have commonly leſs pernicious Conſequences.* There are fewer Obſtacles to contend with, than in a more advanced Age. We muſt, nevertheleſs, except thoſe in the Glands of the Lungs. The Diſorders which theſe produce, are more quick and violent in Youth; and their Courſe more difficult to be ſtopped.

## *Of the* CURE *of* Obſtructions *in the* GLANDS.

Method of Cure.

THE Method of Cure, whereby to free the obſtructed Glands, is what we are now to treat of.

Topical Remedies, uſeful in External Obſtructions only.

If the Obſtruction be only External, the Application of ſome *Topical* Remedies may contribute to diſſolve the Humour which cauſes it. But if Internal, we muſt neceſſarily have Recourſe to Internal Remedies.

Three Principles to be recollected.

Before we reſolve upon the Choice of theſe laſt, it will be needful to recollect Three Principles, which we have before laid down.

Thickneſs of the Humour in the Glands.

*An Obſtruction in the Glands begins always with an Incraſſation of the Humour, which ought to be ſecreted there.*

Its Alteration in the Blood itſelf.

*The Humour is vitiated in the Blood itſelf*; there it contracts that Groſsneſs, that vicious Thickneſs, which will not ſuffer it to flow in the Secretory and Excretory Veſſels; ſo that there can be no Doubt, but what ſtill *circulates* in the Blood, and has not, as yet, entered thoſe Veſſels, retains this Thick and Groſs Quality.

This Humour in the Veſſels not to be diſſolved but by Juices of the ſame Quality.

*The Humour, ſtagnating in the obſtructed Veſſels, ſuffers no Fluid of a different Quality to approach and mix with it.* If it ſuffers an intimate Union, it is only with Liquors of the ſame Nature with itſelf. Neither can it be thinned and diluted by theſe Homogeneous Juices, 'till after they themſelves have been diſſolved and rendered more fluid; without this, ſo far from diminiſhing the Obſtruction of the Part, they will only increaſe it by their Mixture with the other.

First Intention in the Cure of Obſtructions.

The Reſult of theſe Three Principles is, That in Order to ſubdue Obſtructions, the Firſt Intention muſt be to rectify the Ill Quality of the Juices which are ſtill in the Blood. It is neceſſary to reſtore their Fluidity: After which, when they come in their Courſe to paſs by the Orifices of the obſtructed Veſſels, they will unite with the groſs Humour detained there; they will moiſten and dilute it by Degrees. 'Tis much in the ſame Manner we ſee the melted Wax inſenſibly ſoften the Hard, upon which it is dropped continually. The incraſſated Humour in the Glands, being thus from Time to Time diluted by theſe fine and penetrating Juices, will be divided, will loſe its Groſſneſs, and renew its Courſe. The Veſſels will recover their Tone; and the Obſtruction, leſſened by Degrees, will at laſt be wholly removed along with its Cauſe.

Medicines Homogeneous to the Humour in the Blood, moſt proper to reſtore Fluidity to it.

It remains to inquire what Medicines may be moſt proper to dilute and attenuate the thick Humour with which the Blood is oppreſs'd. Theſe muſt be ſuch as approach the neareſt to its Quality; and which therefore may be capable of making the ſtrongeſt Impreſſions upon it: With due Care that they be not contrary to the Patient's Conſtitution. Thus *Mercury* acts moſt powerfully upon the *Venereal Virus*; *the Bark* upon the Humour, which produces *Intermitting Fevers*; and *Hypecacuana* upon that, which by obſtructing the Glands of the Inteſtines, cauſes a *Dyſentery*.

These are to be uſher'd in by other Remedies;

Notwithſtanding whatever uſe may be made of Medicines appropriate to the Genius of the incraſſated Humour in the Blood, they ought always to be preceded and aſſiſted by other Remedies. Bleeding muſt be the firſt Thing employ'd, in order to empty the diſtended, embaraſs'd Veſſels; after that Diluting Medicines, to attenuate and thin the groſs Humour. *Laſtly*, we muſt uſe Cathartics and Emetics, to evacuate what ſhall have been diſſolved, or what may have been collected from the Beginning in the *Primæ Viæ*.

*viz.* Bleeding, Diluting, and laſtly Purging.

What Sort of Bleeding.

I cannot here omit two general Reflections to be made upon Bleeding and Purging, when they are to be uſed againſt Obſtructions in the Glands.

Derivative not to be uſed.

*Derivative Bleeding*, that is to ſay the Bleeding which cauſes the Blood to flow more plentifully into the oppreſs'd Parts, is moſt carefully to be avoided. This will only put it in a Condition of making greater Efforts againſt the Orifices of the Lymphatic Arteries, whoſe Dilatation, cauſed by the Thickneſs of the *Lympha*, will facilitate its Entrance. Here then it may occaſion an Inflammation, ſo much the more terrible, the more obſtructed the Part is. An Accident which would oblige us to have Recourſe to frequent *Revulſive Bleeding*. This is the firſt Inconvenience, excluding the Uſe of *Derivative Bleeding*.

But allowing that the Blood may not on this Occaſion force its Way into the Lymphatic Arteries, and excite an Inflammation; at leaſt a larger Quantity of *Lympha*, and of the Humour, will be determin'd to flow into the obſtructed Part. And ſince this Humour, not having been attenuated and diſſolved, muſt be ſtill thick and groſs, 'tis evident, that inſtead of freeing the Secretory, or Lymphatic Veſſels, 'twill actually increaſe their Oppreſſion.

The only Benefit to be expected from Derivative Bleeding in this Caſe, is, that the Blood flowing more plentifully into the Part, may, by its Rapidity, carry off the Humour obſtructed in the Secretory and Excretory Veſſels of the Glands. But as there is no immediate Communication between theſe and the Blood-Veſſels, we cannot hope to diſengage the Part any other Way, than by hindering the Juices from flowing thither in too great Abundance. Which is not to be attain'd, but by emptying the Blood-Veſſels of the Part; and that is the Effect of Revulſive Bleeding alone.

Revulſive Bleeding alone effectual.

Purging of great Uſe.

As to what relates to Purging, we know 'tis of very great Uſe in Obſtructions.

ons. Beſides that it directly tends to attenuate and diſſolve the Humours; another peculiar Effect of it is to carry off and diſcharge them. But this is not to be uſed at Random, and without due Preparation.

Precautions to be obſerv'd.

*Our firſt Care ought to be,* as well as in Acute Diſeaſes, *to render the Juices more fluid, and the Parts more ſupple.* Bleeding therefore, and Diluting Medicines muſt come firſt (as we have already obſerv'd;) eſpecially when the Obſtruction is conſiderable.

*Afterward, we muſt apply our ſelves to diſcharge the vicious Humours,* which ſhall have diſtill'd into the *Primæ Viæ.* To this End we muſt uſe Purging, before we call in the Aid of Deobſtruents: Frequent Vomiting is ſtill more effectual. This more powerfully frees the Glands, and with greater Certainty carries off the Humours which viciate the Chyle, and diſturb Digeſtion.

Deobſtruents to ſucceed Purging.

*Laſtly, we come to uſe Deobſtruents* after the *Primæ Viæ* ſhall have been cleanſed from the Humours, which might alter the Quality, and weaken the Action of theſe Medicines.

When there has not been a ſufficient Evacuation of theſe Humours, upon the Deobſtruents mixing with them, there will be rais'd an Efferveſcence, by which the Patient will be expoſed to the Torment of a Load and Twitchings in his Stomach; to Cardiac Paſſions, Swoonings, Reachings, Vomiting, painful Motions, and Inflations in his Belly, to Cholicks and Looſeneſſes.

Theſe Accidents vex and diſcourage him; his Patience is tir'd; his Hopes deſtroy'd: And the Phyſician, unleſs he be as Reſolute as Skilful, yielding to vulgar Prejudice, or deceiving himſelf, forſakes his firſt Intentions, tho' never ſo Juſt and Salutary.

All that he has to do in this Caſe, is, To ſuſpend the Uſe of Deobſtruents, in order to return to them ſome Time afterwards. For he muſt be far from renouncing them abſolutely: They are the only Medicines that can complete the Cure. All that can be done, is to vary and diverſify their Preparations, and by Degrees to diſpoſe the *Primæ Viæ* to receive them with Eaſe, and to ſuffer their Action, without giving Occaſion to the abovementioned Accidents. To this End it is often neceſſary, either to mix them with

Cathartics, or to purge frequently during the Uſe of them.

We ſhall here finiſh our Reflections upon the ANIMAL OECONOMY, and the Uſe of General Remedies in Chronical and Acute Diſeaſes.

Tho' we have not thought it neceſſary to exhauſt this Subject, yet what we have laid down, may ſerve for a Foundation to thoſe Obſervations, which we may hereafter communicate to the Publick, concerning ſeveral Diſeaſes; as likewiſe to thoſe we are now about to offer concerning the SMALL-POX.

# OBSERVATIONS UPON THE SMALL-POX.

## *A* GENERAL IDEA *of the Small-Pox.*

Small-Pox al-moſt inevitable.

THERE is no Diſeaſe that can be leſs guarded againſt, than the Small-Pox. The almoſt unavoidable Neceſſity of undergoing it one time or other has induced ſome Phyſicians to think, that Infants, before their Birth, even in their Mother's Womb, contract

Source of this Diſeaſe, according to ſome Authors.

the Venom which produces it. This, as all other Humours, is contain'd in the *Lympha*. There it unfolds it ſelf ſooner or later, according as it is more or leſs thick and groſs, according as the Air or *Regimen* influence it.

Variety of Events.

The Event of theſe Diſeaſes is equally various and doubtful: Some go off without cauſing any violent Revolution; others, are attended with dreadful Symptoms. And there are others again, which moſt commonly have a fatal Iſſue, whatever Means are uſed in Oppoſition to them.

The Danger not ſufficiently apprehended.

Mankind for a long time thought there was little Danger in the Small-Pox. They were grown as it were familiar with them, by being accuſtomed to ſee the Recovery of moſt Children who had them, effected by a very eaſy plain Method of Cure. 'Twas with ſome Amazement they beheld their fatal Effects upon Perſons more advanc'd in Years. Phyſicians themſelves were ſurprized at them. Their ill Succeſs on ſome Occaſions, has frequently induced them to apply Remedies of a quite different Nature to the ſelf-ſame Kind of the Small-Pox: As others again have inſtituted general Methods of Cure, wherein all the ſeveral Kinds are treated in the ſame uniform Manner.

Different Methods of Cure inſtituted.

First Method, to diſſolve the Morbifick Matter by Active Medicines.

All the grievous Symptoms in this Diſeaſe were aſcribed by ſome, to the exceſſive Fixedneſs and Groſsneſs of the Humour, by which it was render'd unable to throw it ſelf out of a very thick Blood. Upon this Principle, they employ'd only Active Medicines, ſuch as were fit to ſet the Ferment in the Blood a working.

Second Method, to incraſſate the Juices by cooling Medicines.

Others on the contrary, attributed the frequent and fatal Cataſtrophes of this Diſeaſe, to the Diſſolution and ill Quality of this ſame Humour, exciting too violent an Agitation in the Blood; from whence aroſe in all the Juices a total, and conſequently a mortal Diſſolution. This Theory induced them to endeavour the thickening of the Juices by cooling Medicines.

Third Method, Bleeding recurr'd to to quiet the Diſturbance in the Blood.

Many again, imputing all the Diſorders of the Small-Pox, to the raging Heat and Rarefaction of the Blood, or to the Stiffneſs and convulſive Tenſion of the Solids, ſcarce uſed any other Remedy but repeated Bleeding.

Defect of theſe Methods.

Each of theſe Methods was eſteem'd the beſt, by thoſe who had embraced it; and was indiſcriminately apply'd to all the ſeveral Sorts of the Small Pox, without conſidering that their Variety did plainly direct they ſhould be variouſly treated.

The ſeveral Kinds of the Small-Pox not ſufficiently diſtinguiſh'd.

Moſt of the Authors, who have wrote on this Subject, have obſerv'd as little Exactneſs. The more we conſult them, the more we perceive that they did not deeply reflect upon, nor diſtinguiſh the different Species of the Small-Pox. Even thoſe, who could not help diſcerning ſome Variety in their Cauſes and Symptoms, have yet preſcribed one uniform Method of Cure. Prejudiced to that which they themſelves had inſtituted, or which they had borrowed from others, they have even gone ſo far, as to condemn all the reſt; without any Regard to ſuch as were plainly indicated in certain Caſes.

Tho' diſtinguiſh'd, yet not regarded in the Method of Cure.

Obſervations in this Treatiſe more particular and exact.

Theſe are the Faults we ſhall endeavour to avoid in this Work. I don't pretend to write a compleat Treatiſe upon the Small-Pox: But ſhall ſatisfy my ſelf with collecting the Obſervations, which I have had Opportunity to make upon each different Kind; and which may perhaps excite others of the Profeſſion, beſt qualified by their Skill and Practice, to communicate the like in their Turn.

## *The* PRINCIPAL SYMPTOMS *indicating the Small-Pox in general.*

THE Small-Pox ſhew themſelves by a greater or ſmaller Number of Puſtles, diſperſed over the whole Body, riſing in a round Form, and terminating in a whitiſh Point, having a very red Circle at their Baſis; and growing inſenſibly larger for ſeveral Days, till at laſt they ſuppurate and dry up.

Quality of the Puſtles, the ſureſt Indication of the Small-Pox.

Theſe are the certain Tokens of the Small-Pox: 'Tis impoſſible to miſtake them. But that is not enough for a Phyſician. It his Buſineſs to prognoſtitcate them before their Eruption; or at leaſt to diſcern them when they begin to come out. He cannot therefore be too careful in obſerving the Symptoms which indicate them when they are ready to appear, or which accompany them when they juſt begin to riſe.

The Small-Pox ought to be foreſeen before their Eruption, at leaſt as ſoon as they begin to riſe.

Symptoms foreſhewing the Small-Pox.

Some Days before, the Sick commonly finds himſelf oppreſs'd with Wearineſs, Faintneſs, Languors: Without being able to diſcover any apparent Cauſe, to which this Alteration may be attributed.

Dulneſs, Languiſhing.

A Fever next ſucceeds: Along with it are felt Pains in the Head and Back,

Fever, Head-ach, Vomiting, &c.

Vomitings and other Symptoms peculiar to the ſeveral Sorts of the Small-Pox.

Red Spots on the Skin.

Two or Three Days after, red Spots are perceiv'd up and down, particularly on the Face and Breaſt. These do not ſtart up all at once, as in Raſhes; on the contrary, they appear at firſt in ſmall Numbers; they have a riſing in the middle, and are mark'd as it were with a ſmall Point, which is the Centre of the Pimple.

How theſe riſe.

Their Figure.

Theſe are the uſual Symptoms preceding the Small-Pox, or indicating them at their Beginning; but then the ſame are frequently diſcover'd in the *Meaſles* which come out with red Spots riſing in the Skin. We muſt therefore be very careful to obſerve the Signs by which theſe two Diſeaſes are diſtinguiſh'd.

Difference between the Symptom of the Meaſles and Small-Pox.

The *Meaſles* are almoſt conſtantly indicated by an hard, dry, troubleſome Cough. The Spots in the Skin are of a leſs regular Figure, and not ſo exactly round as thoſe of the Small-Pox; they are of a brighter red, and branch into one another.

Spots in a Scarlet Fever.

The Spots in a Scarlet Fever, differ alſo from thoſe of the Small-Pox; their Figures are much more irregular, their Colour deeper; and laſtly they are far more flat, and have no riſing in the middle.

# Of the DIFFERENT SORTS of the Small-Pox.

Seven Sorts of Small-Pox, comprehended under two General Claſſes.

LET us now enter upon the Detail of the ſeveral Kinds of the Small-Pox. I have obſerv'd no leſs than Seven, diſtinguiſh'd from each other by the Numbers and Nature of their Puſtles, or by other Symptoms peculiar to each Sort. We muſt firſt, according to the uſual Diviſion rank them under Two General Heads, or Claſſes.

Firſt Claſs. Diſtinct Small-Pox.

Thoſe under the *Firſt* have their Puſtles diſtinct and ſeparate, whence they have the Name of the *Diſtinct Small-Pox*.

Second Claſs: Confluent.

They of the Second Claſs join and run into one another, or are heap'd together; whence theſe take the Name of the *Flux* or *Confluent Small-Pox*.

Unneceſſary Subdiviſion of the Second Claſs.

Some Authors ſubdivide theſe laſt again, and diſtinguiſh them into *Coherent*, when their Puſtles only join each other; and *Confluent*, when they mix with and run into one another. We ſhall not trouble our ſelves with this Diſtinction, which is better ſuited to the Subtilty of the Schools, than to Uſe and Practice.

## *Of the* DISTINCT SMALL-POX.

Two Sorts of the Diſtinct Kind.

THE *Diſtinct Small-Pox* are of Two Sorts; *viz. Simple*, or *Complicated* and *Malignant*.

How the firſt diſtinguiſh'd from the ſecond.

The firſt Sort is plainly diſtinguiſhable from the other, by this, that all the Symptoms which precede the Eruption, do commonly vaniſh upon that Occaſion.

Symptoms of the firſt Sort before the Eruption.

Theſe uſually are a great Weakneſs; an acute Fever, Drowſineſs, Deliriouſneſs, Convulſions, Pains in the Head, and the Region of the Loins, Reachings, Vomitings, *&c.*

Symptoms of the Malignant Diſtinct Sort.

In the Second Sort; *viz.* the *Malignant Diſtinct*, the Symptoms are very many in Number, and very dangerous. The Patient is ſeiz'd with a burning continued Fever; he falls under an extreme Faintneſs; his Skin is dry and burning-hot; the Pulſe of the *Carotid Arteries* is very high, and his *Tendons* remarkably ſtiff. His Eyes are fierce and ſparkling, and upon the *Conjunctiva* we find ſeveral Lymphatic Veſſels full of Blood. The Pain in his Back is conſiderable, his Head-ach ſometimes violent, ſometimes moderate; commonly without any *Delirium*, Drowſineſs, or even Inclination to ſleep.

Theſe are the Symptoms which uſually preceed the Eruption of this Sort.

These commonly abate after the Eruption.

After the Eruption, we frequently obſerve the Vomiting and Pain in the Back to ceaſe; and find a conſiderable Mitigation in the other Symptoms which ſtill continue. But the Fever, which at firſt appeared ſomewhat abated, quickly after reſumes its Heat, and is particularly noted, by the Violence of every third Paroxyſm. It never intermits, but keeps up the moſt conſiderable Symptoms, and often brings on new ones. For then the Sick are cruelly tormented with Want of Sleep, with ſlight Frenzies, Reſtleſsneſs, Bleeding at the Noſe, eſpecially in the Paroxyſms; with large Sweats, which yet do not relieve the Skin from its dry burning Heat.

But the Fever renew'd.

Whence new Diſorders.

An Inflammation in the Skin betwixt the Puſtles.

Betwixt the Puſtles we frequently obſerve ſome Lymphatic Veſſels of the Skin full of Blood. Theſe produce a Kind of a general Inflammation, like the Meaſles, or a milliary ſcarleth *Eryſipalas*.

Symptoms at the Time of Suppuration.

The Fever and other Symptoms increaſe during the Suppuration; and then the Patient is often ſeiz'd with violent Agitations, Ravings and Convulſions. Neverthleſs the Puſtles ſtill continue elevated, and preſerve a laudable Quality.

Theſe

Moſt of theſe Symptoms appertain to the Malignant Fever.

Theſe are the ſeveral Symptoms which I obſerv'd from the Beginning, and during the Courſe of the *malignant Diſtinct* Sort which raged very much in the Year 1716. It is eaſy to perceive, that moſt of them rather belong to a malignant Fever than to the Small-Pox.

Another Species of the Malignant Diſtinct.

I have obſerv'd a *Second Species* of the *Malignant Diſtinct*, wherein the Fever is very acute, and the other Symptoms like thoſe of the former Sort; from which it is nevertheleſs diſtinguiſhable by the following Symptoms.

How diſtinguiſh'd from the firſt Species.

In this the Fever, which is very raging, is moſt commonly attended with a Kind of Purple Meaſlles; and on ſeveral Parts of the Body, eſpecially the Breaſt, we find an innumerable Multitude of ſmall Veſicles, full of a very clear and ſerous Humour, and making the Skin very rough and uneven.

The Puſtles are ſcatter'd up and down, few in Number, and at conſiderable Diſtances from one another; ſo that commonly there are not above three or four upon an Arm. It is eaſy to diſcern, that in this Caſe the Small-Pox are only Symptomatical, and that a malignant Fever is the principal Diſeaſe.

## *Of the* CONFLUENT SMALL-POX.

Two principal Sorts of the Flux Kind.

COME we now to the Second Claſs of the Small-Pox. This comprehends the *Confluent* Kind, which as well as the *Diſtinct* are divided into two Species; *viz.* the *Simple Confluent* and *Malignant Confluent*.

In each the Puſtles flux variouſly.

In each of theſe the Puſtles are united, and run into one another; and yet they do not flux equally throughout the whole Body. Sometimes they are Confluent on the Face and Head only, and diſtinct in the other Parts. Sometimes they flux over all the Body, except the Head and Face, where they are ſeparate from each other.

Simple Confluent, its Symtoms.

The *Simple Confluent* is that Sort, wherein the Fever and other Symptoms either ceaſe entirely, or conſiderably abate, upon the Eruption. The preceding Symptoms are commonly the ſame with thoſe of the Simple Diſtinct, but a great deal more violent. This Sort were not very common in the Years 1716, 1717.

Four Sorts of the Malignant Confluent.

As to thoſe we have named the *Malignant Confluent*, though Authors commonly admit but Two Sorts of them, we have ob-

obſerved Four, which we take to be different from each other. The firſt is diſtinguiſh'd by the Nature of the Puſtulary Humour it ſelf. Whereas the other Three have the Symptoms of a malignant Fever; with a Sort of an Eruption peculiar to them, which will be deſcribed in its proper Place. This Diſtinction will ſuffice; for I do not pretend to found my Diviſion of the *Malignant Confluent*, upon the various Appearances of the Puſtles. We find the ſame Irregularity in both Sorts of the *Malignant Diſtinct*, and frequently in the *Simple Confluent*.

One Thing is common to them all,

Let us now deſcribe the Symptoms which diſtinguiſh the four Sorts of the Malignant Flux Kind from each other; with this Preliminary Remark, that they have one Symptom common to them all; which is, that the Fever never leaves the Patient in any of them, during the whole Courſe of the Diſtemper.

Firſt Sort of the Malignant Confluent.

Diſorders preceding the Eruption.

The firſt Sort is known by clear tranſparent Puſtles, full of a very limpid *Serum*, whence it has derived the Name of the *Cryſtalline Small-Pox*. For ſome Days this Sort is not eaſily diſtinguiſhable, by reaſon that the Puſtles are not ſufficiently raiſ'd. However, it was preceded by the following Symptoms in thoſe Patients, who have fallen under my Care. An acute Fever, a ſerous Looſeneſs in a great Degree, Head-ach, violent Thirſt, the Skin a pale white, and all the Parts ſlightly ſwell'd.

Symptoms at, and after the Eruption.

When the Eruption begins, the Puſtles appear of a paler Red, they riſe quicker and higher, and become larger, than in the other Sorts. The Circle at the Bottom of each Puſtle continues of a paler Colour. The Skin in which the Humour is contain'd, is very thin. Several Puſtles frequently run into one another, and form a Bladder of conſiderable Bulk full of ſerous Humours. When that is prick'd, and the Humour ſqueez'd out, the containing Skin appears pale like the Baſes of the Puſtles: The Swelling of all the Parts increaſes to an exceſſive Degree; which participates of the Nature of an *Œdema.* And laſtly the malignant Fever, which ſometimes attends this Sort, ſhews it ſelf; either in its own proper Symptoms; or in a *miliary Eryſipelas*, like what we have obſerv'd in the *Malignant Diſtinct.*

Second Sort of the Malignant Confluent.

Symptoms before the Eruption, the ſame as in the Malignant Diſtinct.

We have found the Symptoms preceding the *ſecond Sort of the Malignant Flux Kind*, the ſame with thoſe of the firſt Sort of the Malignant Diſtinct. But here the Fever is commonly more acute, and its Paroxyſms longer and more violent.

Fever more acute, tho' attended with leſs dreadful Symptoms.

Yet this is not always attended with Vomiting, Reachings to Vomit, Dozing, Deliria, and ſuch like frightful Symptoms. The moſt important are ſuch as fall not under the Notice of any but the careful Phyſician; namely, a quick Pulſe of the *Carotid* Arteries, Redneſs of the Eyes, and Stiffneſs of the Tendons.

Other Symptoms after the Eruption.

The Eruption is commonly finiſh'd in a ſhort Time. The Puſtles are of a more irregular Figure than in the other Sorts. Beſides, they are often flat in the middle; and their Ring of a deep red Colour. They fill but moderately, eſpecially on the Face, which is ſwell'd and puffed up the firſt Day of the Eruption. All the *Cuticula* of this laſt Part is rais'd, and looks like one flat ſmooth Puſtle. The Spaces between the Puſtles elſewhere are mark'd with *Eriſipelatoſe*, and often *purple* Spots. One while there is no ſenſible Perſpiration, and the Skin feels extremely dry and burning. A while after come profuſe Sweats, and yet ſtill an intenſe dry Heat is felt in the Skin. The Urine moſt commonly is made in ſmall Quantities, and of a very bright Yellow. The Pulſe is either hard and low, or very ſtrong and high: The Eyes are ſometimes red and ſparkling, but unable to endure the Light. Sometimes they are dull and lifeleſs, and then the Pupil is enlarged be-

beyond its common Size. The Sick endure violent Head-aches, particularly when they are free from Dozing or Deliriouſneſs. An Inflexibility of the Tendons, Convulſions, and *Deliria* are more frequent in this Sort than any other.

Third Sort of the Malignant Confluent.

The Third Sort of the *Malignant Flux-Pox*, are uſher'd in with the Symptoms of the other Sorts. But their Difference ſoon appears by the Eruption, which often begins on the Second Day. The Puſtles are black, and riſe but little. When theſe are open'd, there iſſues a very black and livid Blood, and their Bottom is found mortified. The Patients evacuate Blood by Urine commonly; many of them by Stool; ſome by the Noſe; others at the Mouth, either when they cough, ſpit, or vomit: Nay, I have known it ſtart out of the Eyes of ſome. The Spaces between the Puſtles are of a dark blackiſh Colour; the Fever is very acute, and its Paroxyſms violent.

The Fourth Sort of the Malignant Confluent.

*The Fourth and laſt Sort of the Malignant Confluent*, that have fallen under our Obſervation, ſhews it ſelf in a Sort of Flakes upon the Skin, more eſpecially the Face. Theſe Flakes are form'd of ſeveral Puſtles in a Cluſter together, which are very cloſe to, though actually diſtinct from each other. Between theſe Cluſters are Spaces entirely free from any Pocks. Upon

The Puſtles breaking out in Flakes, diſtinguiſh this from the firſt Sort of the Diſtinct Malignant.

Upon the whole, this fourth *Species* of the *Confluent* Kind has a near Affinity with the firſt Sort of the Diſtinct Malignant. It is attended with the ſame Symptoms, both before and after the Eruption. It is, therefore, only on Account of the different Diſpoſition of the Puſtles, that we have been induced to diſtinguiſh this Sort from the other, and to make it a *Species* apart.

Reaſons for making ſo many different Sorts.

We ſhall here make an End of enumerating the ſeveral Sorts of the Small-Pox, which we have found neceſſary to increaſe beyond the uſual Number. The Reaſon of this will be evident to any one, who attends to their different Symptoms above deſcribed; and to their different Methods of Cure, which we ſhall explain in the Sequel of this Diſcourſe; after having firſt traced out the Cauſes from whence they ſpring; and taken a View of the ſeveral *Prognoſtics*, which indicate their Approach.

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The

# The CAUSE of the Small-Pox in general.

General Cauſe.

A Morbifick Humour in the *Lympha*.

THE General Cauſe of the Small-Pox, as we have already hinted, is an Humour or Ferment contain'd in the *Lympha*. This Humour diſengages it ſelf ſooner or later, in greater or leſs Quantities, according as it is more or leſs entangled. The Quality of the Air we breathe, and the *Regimen* we obſerve, do likewiſe very much contribute to haſten or retard its Solution. When once it begins to diſengage it ſelf, it unites by Degrees with the Lymphatic Juices, which go off through the Glands of the *Primæ Viæ*. There it is collected, there it diffuſes it ſelf, and corrupts the Chyle by its Mixture with it. Then ſucceed Pains in the Stomach, Reaching, Vomiting, and other Accidents, the ordinary Forerunners of the Small-Pox. Part of this Morbifick Matter being left in the Stomach, is evacuated by Stool or Vomiting. Part of it mixing with the Blood, gives to the Paroxyſms of the Fever their Violence and Duration: by Means of which, the Humour at laſt is wholly diſengaged.

Action of this Morbific Matter when it is diſſolved.

This Solution, together with that of the other Humours, muſt of Neceſſity cauſe a very great Rarefaction in the Blood and *Lympha*. Hence a conſiderable Dilatation of the Sanguinary and Lymphatic Veſſels; which produces the Head-ach, Drowſineſs, Pains in the Region of the Reins, Delirium, Reſtleſneſs and other Symptoms preceding the Eruption. Their Violence commonly laſts till ſuch Time as the Morbifick Matter is wholly diſengaged. Should its Solution be imperfect, the Patient would be expoſed to a Second Attack from this Diſeaſe.

Its Union with the *Materia Perſpirabilis*, and the Effects of that.

When all the Parts of this Ferment are let looſe, when they are broken and attenuated, they unite with the Humour which is diſcharged by Perſpiration, and along with it are thrown upon the *Cutaneous Glands*: This Union renders the Perſpirable Humour a great deal more groſs, and obſtructs it in the Excretory Ducts of thoſe Glands; or in the Secretory Veſſels, when theſe others are already obſtructed. Hence is form'd that little Pimple or Riſing, which is perceiv'd at the Beginning of the Eruption, and which afterwards becomes the Centre of the Puſtle.

All the Lymphatic Veſſels ſituated around theſe Secretory and Excretory Ducts, are on this Occaſion very much dilated by their own *Lympha*.

The Blood-Veſſels in their Turn are diſtended by the violent Motion of the Blood. This Motion forces the Orifices of the Lymphatic Veſſels. The Blood enters, is ſtopp'd there, and produces thoſe red Spots, which firſt appear upon the Skin: Still continuing to enter in greater Quantities, at laſt it burſts theſe Veſſels, is extravaſated under the *Cuticula*, and produces thoſe Riſings there, which we call the *Puſtles* of the Small-Pox. At the ſame Time it mixes with the *Lympha*, ferments with it, and expanding ſwells the Puſtles. Laſtly, the Humour comes to a Suppuration, is dried up, and ſo finiſhes the Courſe of the Diſeaſe.

Different Species of the Small-Pox accounted for.

This *Mechaniſm* accounts for the different Species of the Small-Pox, as we have diſtinguiſh'd them.

Whence the Simple.

*When the Morbifick Matter* is wholly thrown upon the Glands of the Skin, it there produces the Small-Pox of the *Simple* Kind; either *Diſtinct* or *Confluent*, according to its greater or leſſer Quantity, its perfect or imperfect Solution.

Whence the Complicated or Malignant.

When the Blood abounds wirh Humours of different Qualities, which are lkiewiſe diſſolv'd along with this Variolous Humour, the Diſeaſe in that Caſe cannot be Simple, but muſt be Complicated.

*The Variolous Humour* may indeed wholly unite with the *Materia Perſpirabilis*, and ſo be thrown upon the Cutaneous Glands. But the other Juices, whoſe Natures are different, and which do not take this Courſe, keep up the Heat of the Fever; form Obſtructions in the other Glands, ſuch as thoſe which certainly exiſt in the Lungs, and perhaps in the Membranes of the Brain, *&c*; and by that Means produce Inflammatory or Malignant Fevers, which render the Small-Pox ſo fatal. In ſhort, it is the different Genius of theſe Humours, which cauſes that Variety in the Malignant Kinds of the Small-Pox before noted.

Effects produced by the other Juices of different Qualities.

The Prognoſticks come next in Order to be treated of.

## *Of the* PROGNOSTICS *of the different Species of the Small-Pox.*

THE *Symptoms* ſhewing the Approach of the *Simple-Diſtinct*, or *Simple-Confluent*, ſeem much more violent, and yet are far leſs dangerous, than thoſe which precede the *Malignant* Sorts. On the other hand, theſe laſt ſeem of leſs Importance, becauſe they are commonly no other than the Forerunners of the Malignant Fever. Theſe are always latent and obſcure; but their Conſequences are on that very Account the more terrible. The ambiguous Circumſtances, which attend the Diſeaſe at its ſetting out, do not give us that Apprehenſion which they ought, and oft-times lead us into a fatal Security. The Sick waits with Patience the End of the Paroxyſm; and ſometimes endures two or three of them before he calls for Help, or thinks he needs it; in the mean time the Eruption approaches: And then it may well have happen'd, that the Blood is already got into the Lymphatic Veſſels of the Brain, and the Inflammation there may have arrived at ſuch an Height, that all Remedies will be vain. In theſe ſad Circumſtances, the Phyſician has all the Reaſon in the World to deſpair of Succeſs; ſince that would have been doubtful, had he even been call'd the Moment the Patient was firſt taken ill.

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## *Of the* PROGNOSTICS *in the Simple Small-Pox.*

The Simple Diſtinct often no more than a favourable *Criſis.*

THE *Simple-Diſtinct Sort* is commonly nothing but a ſalutary *Criſis*, wherein the Fever and other Symptoms immediately vaniſh after the Eruption, becauſe all the Morbifick Matter is diſengaged and thrown upon the Glands of the Skin. All that is incumbent upon the Phyſician in this Caſe, is prudently to guard againſt ſome Diſeaſes, which may ariſe from other Cauſes, and be complicated with the Small Pox. Theſe Foreign Accidents, whenever they happen, can be imputed to nothing but ſome Fault in the *Regimen*, or ſome *Feveriſh Motion*, as independent upon the Small-Pox, and as difficult to be foreſeen, as it would be in a State of perfect Health.

Prognoſtic in the Simple Confluent.

We are not ſo free from Danger in the *Simple-Confluent*; for it is certain, the Variolous Matter muſt abound very much. We therefore cannot be too much upon our Guard before, but eſpecially during the Eruption; whilſt the Humour is diſſolving, and the Blood a rareſying to a prodigious Degree. Here we have juſt Grounds to apprehend the Blood's forcing its Way at the very firſt into the Lymphatic Veſſels of the Brain. This happens chiefly from not having had Recourſe to Bleeding at the Beginning of the Diſtemper, and to other Remedies which ſhall be hereafter mentioned.

Obſtruction in the Lymphatic Veſſels of the Brain moſt to be dreaded.

This ſometimes not perceivable at firſt.

Since the Fever which appeared at firſt, almoſt conſtantly ceaſes after the Eruption, theſe Obſtructions ſometimes lie hid, but that is only for a Time. For when the Fever of the Suppuration begins; when the Patient's Blood is enraged, either by an improper *Regimen*, or the Uſe of Wine and ſtrong Cordials; the Juices no longer delay their brisk Fermentation. The *Lympha* is exceſſively rareſy'd; and all at once we are ſurprized with an Inflammation, which but too often proves Mortal.

Its Indications.

Though it be difficult at the Beginning of the Diſtemper to perceive, whether there be any Obſtruction in the Lymphatic Veſſels; yet the following *Signs* may ſerve to make us ſuſpicious.

*If the Patient has not been bled ſufficiently at the firſt, and has taken* ſtrong and hot *Cordials.*

*If* after the Eruption, *he is more addicted to Dozing* than he ought to be.

*If* he has a *Tingling* and *Continual Noiſe* in his Ears.

*If* during his dozing Fits he has *ſlight and frequent Ravings.*

*If* he is very *reſtleſs* and *uneaſy.*

*If his Belly is puff'd up and ſwell'd,* though it has been diſcharg'd by Glyſters.

*If* his *Tongue* is very *dry.*

*If the Urine comes in very ſmall Quantities,* and is *high-colour'd.*

*If the Puſtles do not riſe ſufficiently;* that is; if they are *flat and ſunk in the middle.*

Some of theſe Indications, eſpecially the laſt, give Reaſon to apprehend an Oppreſſion in the Brain. But when they all meet, or the greateſt Part of them, they leave no Room to doubt the Lymphatic Veſſels being ſurcharg'd from the Moment the Fever begun, and the Morbifick Matter got looſe.

Sometimes form'd during the Suppuration.

And even though we ſhould have no Cauſe to believe the Obſtruction form'd at the Beginning, yet we ſhall have all the Reaſon in the World to apprehend it upon the Suppuration, when all the Juices are more briskly rarefy'd. The Blood may then enter the Lymphatic Veſſels, and form a conſiderable Inflammation. Beſides, theſe Veſſels too much diſtended by the rarefy'd *Lympha* it ſelf, may ſometimes too violently compreſs the Glands of the Brain. Nay, ſometimes they are in Danger of burſting and letting out the *Serum*, which they are no longer able to contain.

Its Cauſes then.

And laſtly, the Fever, which is always very violent during the Suppuration, foments and increaſes the Diſorder. This Violence is in Proportion to the Number of the ſuppurating Puſtles. So that during theſe laſt Days, our Fears will teach us to count each Moment. Our only Ground of Hope lies in the Method of Cure, which we have obſerved at the Beginning, and throughout the Courſe of the Diſtemper.

The Fever then violent.

Toſſing and Convulſive Motions, *&c.* are dreadful Symptoms. When theſe come on a ſudden, towards the End of the Suppuration, and after the Patient has been evacuated by Bleeding and Purging, they ſeldom or never fail to ſhew approaching or inevitable Death. The Lymphatic Veſſels muſt have been ſurcharged from the very Beginning; and to

Convulſions, Toſſing, *&c.* dangerous Signs.

Whence they proceed.

that Degree, that it was not in the Power of Evacuations to relieve them.

When leſs dreadful.

On the contrary, if the Patient was neither let Blood nor purged, when firſt invaded by the Diſeaſe, theſe Symptoms will be the leſs terrible; nor will it be impoſſible to prevent the Conſequences by Bleeding, Purging, *&c.* For we may then preſume, they do not depend upon the Surcharge of the Lymphatic Veſſels; but upon the new Dilatation of the Blood-Veſſels, occaſioned by the exceſſive Quantity and Rarefaction of the Blood alone.

## PROGNOSTICS *in the Malignant Small-Pox.*

HAving conſider'd the *Prognoſticks* of the *Simple*, we will now examine thoſe of the *Malignant* Small-Pox.

The *Malignant-Diſtinct* are moſt commonly leſs cruel, than when they are Confluent.

Of the *Malignant-Confluent*, the firſt Sort are leſs terrible than the Second.

The *Third Species* is the moſt dreadful, and almoſt always Mortal.

The *Fourth Sort* are the leaſt dangerous; and the *Prognoſtics* the ſame with thoſe of the firſt Sort of the Malignant-Diſtinct.

To diſcern the Conſequences which are to be expected in the Malignant Small-Pox, with the greater Certainty, we muſt have an eſpecial Regard to their Symptoms.

* * *

## *Of the* DIFFERENT SYMPTOMS, *on which to found our Prognoſticks in the Malignant Small-Pox.*

Favourable Symptoms in the Malignant Small-Pox.

WE will begin with the moſt favourable; ſuch as give reaſonable Hopes of Recovery. Theſe are as follows;

*The Abatement of the Fever after the Eruption*; and the Diminution of all the Symptoms which preceded it.

*A Gradual Eruption*, in which the Puſtles come out inſenſibly.

*The filling of the Puſtles*; and the Redneſs of the Circle at their Baſes.

*The Whiteneſs and Conſiſtency of the Humour in* the Puſtles.

*A Suppleneſs* in the Skin and Tendons.

*A gentle Perſpiration.*

*A moiſt Warmth.*

*The Urine* plentiful and well colour'd.

*No Oppreſſion* in the Head, Breaſt and lower Belly.

*And laſtly, the Abſence of all the Symptoms*, which commonly attend a *Malignant Fever* complicated with the *Small-Pox.*

Bad Symptoms in the Malignant Kind.

The ill, and often fatal Symptoms, are much more numerous, and require a more accurate Explanation. We ſhall diſpoſe them under three Claſſes, with reſpect to the three diſtinct Periods in which they happen.

Three Claſſes of theſe.

The Firſt will comprehend thoſe which appear before the Eruption

The Second, ſuch as happen during the Eruption.

The Third, thoſe which break out at the Time of Suppuration.

Bad Symptoms preceding the Eruption.

Neither the Pains in the Head, the Deliria, and Convulſions, nor any of the other Accidents preceding the Eruption of the Small-Pox, are to be eſteemed the moſt dreadful Symptoms attending that Diſtemper. Theſe muſt be ſuch as are produced by a Malignant Fever join'd with it.

*An Inflammation of the Eyes* before the Eruption ſhould make us apprehend the like in the Brain.

*The Beating of the Carotid Arteries*, higher and ſtronger than it ought to be, when compared with their common Pulſe, is a certain Sign, that the Blood obſtructed in the Brain threatens to puſh into the Lymphatic Veſſels there.

*The Skin, when hard, dry, burning hot, and full of Pain*, ſhews plainly that there is no longer any Filtration through its Glands: That the Blood and *Lympha* are obſtructed in the Veſſels, and dilate them; that the Fluids circulate with Difficulty; and that the Spirits leave all the Parts in a Convulſive Stiffneſs, thro' which they are hurry'd with Rapidity. Sad Indications! Menacing a *cruel fatal Cataſtrophe*.

Ill-boding Symptoms during the Eruption.

Many diſmal Symptoms ſhew themſelves during the Eruption. The moſt conſiderable of them I ſhall mention in ſo many ſeparate Articles.

1. *A too haſty Eruption*; when the greateſt Part of the Puſtles break out within the Compaſs of Four and Twenty Hours.

This ſhews a too quick and ſudden Diſſolution of the Variolous Humour; and is commonly the Effect of a violent

Motion, and extravagant Rarefaction of the Blood and *Lympha*: The neceſſary Conſequence of which is, a Dilatation of the Lymphatic Veſſels.

2. A more than ordinary *Swelling of the Head and Face.*

This proceeds from the Sanguinary and Lymphatic Veſſels of theſe Parts being ſurcharged and dilated: And then have we reaſon to fear, leſt the ſame Diſorders ſhould extend to the Brain it ſelf. There is the more Ground for this Apprehenſion, in that the Obſtruction of theſe External Veſſels forces a larger Stream of their Fluids into the Internal Veſſels of the Head, and hinders their Return through the Veſſels of Communication.

3. *A Stiffneſs in the Tendons*, without any Convulſive Motions; this ſhews an Inflammation already form'd, or at leaſt an Inflammatory Diſpoſition in the Brain.

4. *Profuſe Sweats.*

Theſe indicate a broken Texture, or total Diſſolution of the Fluids.

5. *The Flatneſs and ſinking of the Puſtles.*

We are to infer from this, that the Morbifick Matter is not ſufficiently diſengaged; that it has not been able to unite and mix with the *Materia Perſpirabilis*; and that the *Lympha* ſtill continues too groſs, and too much impregnated with this Ferment. In this Caſe we ſhall find, that when this Humour comes to unite with others beſides that of Perſpiration, it will obſtruct the Glands upon which it is thrown, and there bring on an Inflammation.

6. *An Eryſipelatoſe Inflammation*, in the Spaces between the Puſtles.

This commonly implies a like Inflammation, either in the Brain or *Thorax.*

7. *The too ſmall Quantity, or thick turbid Condition of the Urine.*

The Viciouſneſs of this Secretion proceeds on this Occaſion; either from the *Craſis* of the Blood being deſtroy'd; or from a violent tumultuous Motion of all the Juices; or from an Obſtruction in the Glands of the Liver, or ſome other Part.

8. *The too great Plenty*, and Crudity of the Urine.

This ſhews the Juices to be too thick and coagulated, and that the *Serum* is ſeparated from them.

9. *Involuntary Tears*, from one or both Eyes, without any conſiderable Inflammation of the Eye-lids.

Theſe are commonly owing to an Inflammation in the Brain near the Origin of the Nerves belonging to the Eyes. The ſame is to be fear'd, when one Eye twinkles and ſhuts more frequently than the other; or when the Sick can by no means endure the Light.

What to be expected from theſe Symptoms.

All theſe Symptoms bid us expect ſomething fatal about the Time of Suppuration; eſpecially if they appear, after all neceſſary Means have been us'd from the very Beginning; and when they do not ſenſibly abate, after the Eruption is entirely over. From the Obſtinacy with which they perſiſt, we may juſtly conclude the greateſt Part of the Lymphatics were obſtructed, from the Time that the Variolous Humour got looſe. This Obſtruction does neceſſarily increaſe when the Suppuration comes on; and then, adieu to all Hopes of Recovery.

Two other fatal Symptoms during the Eruption.

To theſe Symptoms, which ſeldom or never threaten leſs than Death, we will add two others equally terrible.

*Sometimes the Face* is ſo wholly cover'd, and the Puſtles ſo confluent, that they ſeem but one. This Symptom, which is one of the moſt dreadful, is cauſed by an univerſal Obſtruction of the Veſſels belonging to the Face: From whence the like is to be apprehended for the Brain.

*The Danger is no leſs*, when the *Ptyaliſm*, or Spitting, which comes on at the Beginning of the Eruption, furniſheth only a very thick and viſcous Spittle. This is the Conſequence of the general Incraſſation of the *Lympha*, which infers a great Dilatation of its Veſſels. Hence may ariſe ſeveral Diſorders; ſuch as an Obſtruction of the *Lympha* in theſe Veſſels; an ouzing of ſerous Humours thro' their Membranes; an Extravaſation of the *Lympha* and aqueous Humours from ſome of theſe being burſt; or an Inflammation upon the Brain.

Indeed, when the Blood and *Lympha* come to be rareſy'd, (as they conſtantly are at the Time of Suppuration) the Lymphatic Veſſels dilate ſtill more and more. The Obſtruction begins, or if already form'd, increaſes; the Circulation of the Fluids is interrupted; the Glands of the Brain are compreſs'd by the ſurrounding Veſſels; the Salivation ſtopp'd; the Spirits no longer ſeparated in the Brain: Inevitable Death comes next.

Dangerous Symptoms at the Time of Suppuration.

There ſtill remains a Third Claſs of dangerous Symptoms to be deſcrib'd, namely, thoſe which appear at the Time of Suppuration. Under this we ſhall not comprehend the Fever, which always becomes more violent on this Occaſion. There is nothing critical in this. There are other Accidents which require our Attention.

*If thoſe which diſappear'd after the Eruption revive* on a ſudden, when the Suppuration comes on, and with conſiderable Violence; the Patient will be in extreme Danger, eſpecially if he has not had proper Help from the Beginning.

*When the purulent Matter is too thin* and clear, there is Reaſon to apprehend the like Diſſolution in the Juices. This Symptom, which commonly is a very threatning one, is nevertheleſs not near ſo much in the Firſt Sort of the Malignant-Confluent.

*The Blackneſs of the Puſtles is moſt commonly a very dreadful Sign*; however, we are not to deſpair, till we have open'd ſome of them to examine whence this Colour ariſes.

*If the Humour* they contain be mix'd with clotted Blood; if the Skin beneath appears Vermilion-red, the Blackneſs ſignifies nothing. We may fairly preſume, 'twas owing only to ſome Bruiſe in that Part. For it is very poſſible, that by reſting upon it, or from ſome accidental Preſſure, a few Drops of Blood may be forced into the Puſtle.

*On the contrary*, when the Humour is black of it ſelf, we ſeldom diſcover any Mixture of the Blood with it; or if we do, it is not clotted as in the firſt Caſe, but black and fluid. The Bottom of the Puſtle, moreover, is of a deep blackiſh Red. Then have we all the Reaſon in the World to conclude, that the *Craſis* of the Blood is diſſolved and broke to pieces; and that the Parts will quickly be invaded by a Mortification, which never fails to kill.

*When the Puſtles are ſtruck in all on a ſudden*, and the Humour, tho' no way let out, diſappears; this Accident ſhews an univerſal Diſſolution in the Blood. The ſame is equally to be apprehended, when the Parts, which were ſwoln and inflated, are all at once empty'd and depreſs'd.

*If in the Looſeneſſes* which ſhall happen, the Evacuations are greeniſh and very ſerous, theſe bode nothing but ill. But if they are of a thick Conſiſtency, bilioſe, and reſembling a Sort of Peaſe-Soup, they will then be ſalutary; provided always that the Puſtles on this Occaſion do not ſtrike in.

*When the Ptyaliſm* is haſtily ſtopp'd, and at the ſame time the Glands of the Throat obſtructed and ſwoln, no Hopes of Life remain.

Symptoms of the Malignant Fever hardly diſcernible at firſt.

Tho' the Symptoms of the Malignant Fever, which often goes along with the Small-Pox, be very terrible, yet they too frequently eſcape the Notice and Inſpection of thoſe who attend the Sick. I have ſhewn above, that they indicate an Obſtruction already form'd, or about to be form'd, in the Lymphatic Veſſels of the Brain. Now this neglected, or ſuffer'd to arrive at a certain Pitch, moſt commonly terminates in an Inflammation of the Brain it ſelf, in an Extravaſation of the Blood, in an ouzing of the ſerous Humours through the Coats of theſe Veſſels, or in an *Abceſs* there. Theſe Diſorders are manifeſt enough to Phyſicians, towards the Concluſion of the Diſtemper; and are moreover demonſtrable by the opening of thoſe, who have periſh'd in it: For we always find

Often cauſe an Inflammation in the Brain.

Proofs of this Inflammation in dead Bodies.

Either, *Extravaſated Blood* in the Brain.

*A Quantity of Serum* diſcharged into the Ventricles, or upon the Circumvolutions of the Brain under the *Pia Mater*.

*A prodigious Number of red Specks* in the Medullary Subſtance of this Part, which plainly demonſtrate its Inflammation.

Or laſtly, a *Suppurated Humour*, either between the *Meninges*, or betwixt the *Pia Mater* and the Brain, or in ſome other

Part of this Entrail; which Matter appears nothing elſe but a whitiſh thick *Serum.*

'Tis certain theſe are the moſt terrible Accidents in the Small Pox. They alone render the Diſeaſe incurable. And without Diſpute, the Cauſe is an Obſtruction of the Blood or *Lympha* in the Veſſels of the Brain. Againſt this Diſorder then, the Source of all the reſt, muſt our principal Endeavours be bent.

## *The Uſe of* BLEEDING *in the Malignant Small-Pox.*

Bleeding the moſt proper Remedy to relieve the Brain.

NOthing is more effectual than Bleeding to divert, or, if poſſible, to remove, an Obſtruction from the Veſſels of the Brain. It alone can hinder the Blood from flowing into the Lymphatic Veſſels. In ſuch a Country therefore as ours, we are indiſpenſibly oblig'd to have recourſe to it at the Beginning of the Small-Pox; in ſpite of thoſe vulgar Prejudices, which ſo unreaſonably decry it.

It is more or leſs neceſſary, according to the different Circumſtances of the Diſeaſe, and the Patient's Habit of Body.

When an Obſtruction is moſt to be apprehended.

In this Diſtemper, there are two Seaſons, wherein the Blood and *Lympha* are conſiderably expanded. The firſt is, when the Morbifick Matter is diſſolving, that is to ſay, before the Eruption; the ſecond, that of Suppuration. In both theſe States, it is eaſy to perceive, how much we ought to fear the Dilatation of the Lymphatic Veſſels, and the Irruption of the Blood into them; which would produce an Inflammation.

To this Principle are to be join'd three Conſiderations.

Perſons moſt expoſed to an Inflammation.

*Plethoric Conſtitutions* are more liable to an Inflammation, than thoſe which leſs abound with Blood.

*An Inflammation* more eaſily befals thoſe, whoſe Blood is thick, and diſpoſed to undergo a violent Rarefaction; than ſuch as have a thin, ſubtle, fluid Blood, not apt to rarefy; namely, Children, and even grown Perſons, who have been uſed to a regular, uniform, and temperate way of living.

And in the third place, this *Obſtruction* is more likely to happen in Perſons, whoſe *Lympha* is thicker and more capable of Rarefaction than ordinary.

We ought, therefore, to take away greater Quantities of Blood from thoſe Patients who abound with it, and from thoſe in whom the ſaid Fluid, as well as the *Lympha*, is of a thick groſs Contexture.

Repeated Bleeding not neceſſary in the Simple-Diſtinct.

As to the Repetition of Bleeding, that muſt be regulated according to the Nature and Kind of the Small-Pox.

In the *Simple-Diſtinſt*, the Diſſolution of the Variolous Matter, and the Suppuration, cauſe leſs Diſturbance and Rarefaction in the Juices; becauſe its Quantity is but ſmall, and the Puſtles in no great Numbers. So that there is no Need of repeated Bleeding.

Neceſſary in the Confluent of every Sort.

On the other Hand, the Repetition is moſt neceſſary in the *Confluent* of every Sort. For the Morbifick Humour can neither get looſe, nor the Puſtles come to a Suppuration, without exciting violent Motions in the Juices. The Quantity of this Ferment, and the Number of the Puſtles muſt needs have that Effect. So that a conſiderable Rarefaction of the Fluids, and an exceſſive Diſtenſion of the Veſſels are unavoidable. Theſe are certain Fore-runners of an approaching Obſtruction and Inflammation; eſpecially if the Veſſels were not diſcharged as ſoon as the Diſeaſe ſhow'd it ſelf.

Veſſels of the Brain moſt ſubject to Obſtruction in the Malignant Small-Pox.

In the *Malignant Kind*, the Lymphatic Veſſels of the Brain are moſt expoſed to an Obſtruction. The Reaſon is plain; but I ſhall forbear to enlarge upon it, till I come to treat upon Malignant Fevers.

Repeated Bleeding therefore neceſſary in this Caſe.

It will be readily granted, that when ſuch Obſtructions are foreſeen by the skilful Phyſician, at the Beginning of this Diſtemper, he at the ſame Time diſcerns the abſolute Neceſſity of Evacuating the Veſſels by Bleeding.

For what other Means on Earth can prevent the fatal Diſtenſion, they muſt otherwiſe ſuffer in the Paroxyſms of the Fever, and during the Suppuration? They who are acquainted with the Structure of the Brain, cannot reflect upon it, without being alarm'd on theſe Occaſions. We muſt therefore let Blood at the Beginning; nor can we too often repeat it. The Manner ought to be ſuited to the Nature of the Small-Pox, and the Violence of the Fever. It muſt be in ſuch Quantities, or with ſuch Repetitions, as may be ſufficient to keep off an Inflammation from the threatned Part, or to relieve that which is already invaded; more eſpecially the Veſſels of the Brain, which are moſt expoſed to this Diſaſter. This is the moſt important, moſt neceſſary Intention of all whatever.

Bleeding in the Foot preferable to any other.

Now Bleeding in the Foot alone can fully anſwer this; it is therefore preferable to any other.

To be convinced of its good Effect on theſe Occaſions, you need only be reſer'd to what has been ſaid concerning it in the *Eſſay upon the Animal OEconomy*, where *Derivative* and *Revulſive* Bleeding were treated on. It will be ſufficient in this Place to recapitulate ſo much of that Diſcourſe, as is applicable to the firſt State of the Small-Pox.

Reaſon for that Preference.

Open a Vein in the Foot, all the lower Veſſels will be empty'd. The Blood iſſuing from the Heart will meet with leſs Reſiſtance in the Deſcending Trunk of the *Aorta*. It will be determin'd to flow that way in a greater Quantity; ſo that the Veſſels of the Head, which in this Diſtemper are the moſt ſubject to be inflam'd, will receive much leſs of it, and may therefore be able to recover their Elaſtic Tone. By this Means, the Obſtructions which are actually form'd, or ready to be ſo, will be diſſipated; according to that Mechaniſm, which we deſcribed in the abovementioned Diſcourſe.

Another Advantage of it.

Another Advantage of Bleeding in the Foot, before the Eruption, is the hindring the Juices from being carry'd in too great Plenty to the Superior Parts, and conſequently the preventing too great a Quantity of the Variolous Matter from being thrown off there.

No Inconvenience in it when in due Time used.

Theſe Benefits are neither oppoſed nor balanced by any Inconvenience. I have never obſerved this Sort of Bleeding to retard the Progreſs or Suppuration of the

Puſtles. I have never found the leaſt Hurt from it, when early and properly uſed. So far from this; its Effects have always been propitious and ſalutary.

Leſs Effectual when delayed.

'Tis true, it loſes a great deal of its Efficacy, when it has been too long neglected; Recourſe is then had to it, only becauſe there is no fairer Proſpect of Succeſs from any Thing elſe: And indeed, not much to be hoped from it. There is ſtill Reaſon to expect much good from it, provided the Inflammation, which we know to be already form'd, has not advanced too far, and made too great an Havock. But this is what we cannot always know exactly. However the Accidents, which may happen after the too late Uſe of it, ought not to be charged upon Bleeding in the Foot; but upon the Diſtemper it ſelf.

The laſt Deciſive Reaſon for Bleeding in the Foot.

Another Conſideration, which ought to fix our Choice to this Sort of Bleeding, is its being ſucceſsfully practis'd in Apoplexies, *Deliria*, Convulſions, and on all Occaſions wherein Obſtructions and Inflammations of the Brain are to be diverted. Can there be any Reaſon then to reject it in the Caſe of the Small-Pox, wherein theſe two Accidents muſt needs prove Fatal?

In what Sort of the Small-Pox, and what Perſons, not ſo abſolutely neceſſary.

We will nevertheleſs allow that it is not equally neceſſary in all Sorts of the Small-

Pox. All thoſe who are invaded by that Diſeaſe, are not expoſed to Inflammations of the Brain, or the other Diſorders we have mentioned. The Quality and Kind of the Small-Pox, the Age of the Patient, his Way of Living, ought to make a very great Difference.

For Inſtance, the *Simple-Diſtinct* are rarely attended with theſe Symptoms; and the *Simple-Confluent* Sort, though more dangerous than the laſt mentioned, are yet infinitely leſs expoſed, than the *Malignant* Kinds.

In Children, and thoſe under Twenty Years of Age, the Glands and Veſſels are not ſo eaſily obſtructed, as in Perſons more advanc'd in Years, and of leſs Regular Lives.

Why the young may be exempted.

The Young owe their Recovery to the Temper and Conſtitution of their Blood, which is more attenuated, and more aqueous, and conſequently leſs ſubject to form Obſtructions. It is leſs impregnated with Saline Particles; thoſe which it does contain, are reduced to leſs Magnitudes: The Fermentation therefore is leſs violent; and the Juices leſs diſpoſed to a brisk Rarefaction, than in Older People. The Young have ſtill another Advantage. Their Perſpiration is much more free; the *Materia Perſpirabilis*, like all the other Juices, very thin and fluid.

It goes off with Eaſe through the Glands of the Skin, which afford a much more open Paſſage: So that all the Secretions are perform'd with far leſs Difficulty in theſe Perſons than the others.

As alſo Temperate Perſons.

The Circumſtances of thoſe, who have been uſed to a Regular Way of Life, are almoſt equally happy. Theſe are ſeldom invaded by the *Malignant* Small Pox; becauſe their Diet has been more plain and temperate.

Their *Lympha*, Stomach, and Inteſtines are not loaded with thoſe Crudities and Peccant Humours, which the Paſſions, Debauches, and High-feeding of the Intemperate form and heap up in theirs.

Notwithſtanding all theſe Diſtinctions in their Favour, we ſtill judge, that we ought to obſerve in their Caſe, the ſureſt Method of Cure. We therefore ſhall never ſcruple to bleed young People at the Beginning of the Diſtemper; and ſhall rather chuſe to do it in the Foot than the Arm. But if their Family and Relations, in Compliance with the vulgar Notion, ſhew an invincible Averſion to Bleeding in the Foot; we ſhall the leſs inſiſt upon it, becauſe the Temper of the Blood, the Kind of the Small-Pox, which in this Caſe are uſually Diſtinct, and Experience it ſelf, give us no Apprehenſion of the abovementioned Accidents.

Indiſpenſably neceſſary to the more advanced in Years.

But induced by all the Reaſons, which have been alledged, we ſhall behave very differently towards Perſons more advanc'd in Age. Being perſuaded that an Inflammation, or Obſtruction in the Glands and Veſſels of the Brain, is very much to be dreaded in their Caſe; and being throughly convinced, that no Remedy is ſo capable of preventing this, as Bleeding in the Foot; no Conſiderations ſhall withhold me from preſcribing it at in the Beginning, and eſpecially before the Eruption. I will now examine the Method of Cure which is to ſucceed it.

## *Of the* USE *of Emetics and Purgative Medicines in the Malignant Small-Pox.*

Reaſons for Vomiting and Purging.

IMmediately after Bleeding, Purgative Medicines, and more eſpecially Emetics take place. I ſhall here ſtate the Reaſons on which this Practice is founded: But beforehand it is neceſſary to refer to what has been ſaid concerning the Cauſe of the Small-Pox.

It was there laid down, that this Diſeaſe was produced by a Ferment, or

Peccant Humour, abounding in the *Lympha*. When this diſſolves and goes off, Part of it entring the Glands of the Stomach and Inteſtines, is thrown into the *Primæ Viæ*. Hence thoſe Reachings, Vomitings, and Looſeneſſes, which preceed this Diſtemper.

The *Primæ Viæ* to be cleanſed from their Crudities.

*Therefore the firſt thing we are to endeavour*, is, to diſcharge the Glands where this Humour may have ſtopp'd, and ſo evacuate the viſcid Crudities, which may have been collected in the *Primæ Viæ*.

The Solution of the Variolous Humour to be aſſiſted.

*Our next Intention muſt be*, to free the Veſſels from the indigeſted Parts of the *Lympha*, which might otherwiſe hinder the Variolous Humour from getting looſe; or from the groſſer Parts of this Humour it ſelf, which, though they begin to diſſolve, are not as yet fine enough to be thrown upon the Glands of the Skin.

Theſe Intentions beſt anſwer'd by Vomiting and Purging.

To anſwer theſe Indications, I know no Remedies ſo efficacious as Emetics ſupported by Purgatives; the Reaſon is evident.

*They remove the Peccant Humours*, which remaining in the *Primæ Viæ*, would viciate the Chyle, and carry their ill Quality into the Blood it ſelf; which would neceſſarily increaſe the Fever.

*They compreſs the Glands*, and ſtrain out the indigeſted Parts of the *Lympha.*

Theſe are the Operations of Emetics, in which they are more ſpeedy and certain than Purges.

Emetics preferable to Cathartics.

For the Efforts made in Vomiting, compreſs the Glands and force out whatever obſtructs them. The whole *Lympha* is more exactly broke and attenuated. Its groſſer Parts diſſolve more eaſily, and are evacuated in greater Plenty; they find an eaſy Paſſage through all the Glands; but eſpecially through thoſe of the Inteſtines, which are more open than thoſe of the Skin.

When we uſe Emetics and Purgatives at the Beginning of the Small-Pox, we do nothing but imitate the Conduct of Nature her ſelf. She ſometimes on theſe Occaſions, excites Vomitings and Looſeneſſes, without being aſſiſted by any thing from without; if it happens that theſe Evacuations are plentiful, the Diſeaſe is the more gentle, and the Event always happy.

Both theſe Evacuations indicated by Nature it ſelf.

We cannot therefore do better than preſcribe theſe Remedies, even before the Small-Pox begin to ſhew themſelves. They are abſolutely neceſſary, when the *Lympha* abounds exceſſively with the Variolous Ferment; for then our Buſineſs is to evacuate Part, that the reſt may be in a Cona Condition of paſſing into the Glands of the Skin with the greater Eaſe and Freedom.

More eſpecially neceſſary in the *Malignant* Small-Pox.

Theſe Remedies are ſtill more neceſſary, when an Inflammatory or Malignant Fever is complicated with the Small-Pox. This Fever always depends upon another Ferment, no leſs pernicious than the aforemention'd, which uniting with the *Lympha*, is along with it obſtructed in the Lymphatic Veſſels of the Brain. If we delay to evacuate this, tho' never ſo ſmall a time, the Paroxyſms of the Fever will become more violent; the Lymphatic Veſſels of the Brain will be overcharged and dilated; an Inflammation ſucceeds, and is quickly follow'd by a fatal *Cataſtrophe*. 'Twill be in vain to have recourſe to Bleeding alone. This may poſſibly indeed hinder the Blood from entring the Lymphatic Veſſels, and the Inflammation from being form'd; but it cannot ſtop the Paroxyſms. Their Violence is to be prevented or quieted no otherwiſe, than by a ſpeedy Evacuation of the Humours contain'd in the *Lympha*.

Tho' the Succeſs of this Method is not infallible; yet at leaſt there is one Advantage which the Patient reaps from this, and no other; and that is, the abating his Agitation, Reſtleſneſs, Delirium, Convulſions, and the Violence of his Fever it ſelf. This I have equally obſerved in thoſe who have been ſo happy as to recover, and in thoſe likewiſe who have periſh'd under the cruel and irreſiſtible Force of the Diſtemper.

Yet after all, how efficacious ſoever Bleeding, Vomiting, and Purging may be in the Small-Pox, we muſt not imagine that theſe Remedies alone are always capable of taking off the Fever, and removing the Oppreſſion which the Lymphatic Veſſels labour under. Even when theſe Symptoms ſhall have vaniſhed, we ſhall be ſtill obliged to follow Nature Step by Step; we muſt never ceaſe attending to the different Circumſtances of each Species of the Small-Pox; for they all merit a particular Attention.

## *The* CURE *of the ſeveral Sorts of the Small-Pox.*

I Am now come to deſcribe the Methods, in which I judge each of theſe Species ought to be treated.

Three Stages of the Diſtemper.

In order to attain the greater Certainty, we muſt diſtinguiſh exactly the Three different *Stages*, into which the Courſe of this Diſeaſe is divided.

*The Firſt* comprehends all the Time preceding the Eruption, and the Three Firſt Days of the Eruption it ſelf; which commonly ends on the Fourth Day incluſive after it begun.

*The Second Stage or Seaſon* is from the Fourth to the Ninth Day incluſively; the Time in which the Suppuration is carry'd on and finiſh'd.

*The Third* extends from the End of the Suppuration, to ſuch Time as the Puſtles dry up and fall of. This uſually happens the Fourteenth or Fifteenth Day. But we are to obſerve, that pretty often, in the *Malignant-Confluent* eſpecially, the Puſtles ſubſiſt, and maintain their Ground much longer.

* * *

## METHOD *of Cure in the Simple-Diſtinct Sort.*

Method of Cure before the Eruption.

WHEN the Symptoms declare the Approach of the *Simple-Diſtinct* Pox, the firſt Thing the Phyſician has to do, is to order Bleeding. The different Cirucmſtances are to direct his Choice, either to the Foot or Arm.

Bleeding in the Foot.

If he is called too late, and has Reaſon to apprehend, that the Time will not allow of reiterated Bleeding, how needful ſoever it might be, he muſt then have immediate Recourſe to Bleeding in the Foot.

He is likewiſe to preſcribe this at the very Beginning, provided he foreſees, from the Regular Way of Living, and low Conſtiturion of his Patient, that bleeding him once only will ſuffice.

On the other Hand, the Violence of the Fever and other Symptoms, the Plenitude of the Veſſels, a Sanguine and Robuſt Conſtitution, irregular Living, *&c.* are Indications, which abſolutely require that the Patient loſe a conſiderable Quantity of Blood. 'Twill be fit therefore to begin with Bleeding in the Arm, with a View of coming a while after to that in the Foot, and even of repeating it, if it ſhall be found neceſſary; which however does not often happen in this Sort of the Small-Pox.

Drink. The Patient ſhall be ſuffer'd to drink plentifully of a light *Ptiſan* made up of *Scorzonera* Root, *Gramen Caninum*, and *Liquorice*.

Clyſters. He muſt take Clyſters, either of *common Water* if the Fever be high, or made up of an *Emollient Decoction* with the *Lenitive*, or *mundify'd Caſſia*, in Caſe it be needful to make them Purgative.

Broth.

Let his Food be either *Veal* or *Chicken* Broth.

Vomiting at the Cloſe of the Paroxyſm.

When the Paroxyſm draws towards a Concluſion, and the Violence of the Fever is abated, that Opportunity muſt be taken to evacuate the Patient, firſt of all by giving an *Emetic*. This Remedy, as we have already obſerved, is moſt efficacious in exonerating the Stomach and *Primæ Viæ* from thoſe ſaline viſcid Humours, in which they abound. It facilitates the Eruption, and diſcharges thro' the Glands of the Inteſtines, Part of the Variolous Humour diffuſed in the Blood; and conſequently leſſens the Number of the Puſtles.

When to purge.

But in Caſe the Emetic does not produce a ſufficient Evacuation downwards, it muſt be ſupported by a gentle Purge; which muſt even be repeated, if there be Occaſion.

Moreover, you need not be afraid of purging the Firſt or Second Day of the Eruption, if there has been no Opportunity of doing it ſooner, or if any urgent Symptom makes it neceſſary.

When the Eruption is over, and the Symptoms diſappear, we may then juſtly expect a favourable Event; eſpecially if the Patient is young, and has been accuſtomed to a moderate Way of Living. It will only now be incumbent on the Phyſician,

ſician, to prevent the Digeſtions from being vitiated, and to guard againſt other Accidents independent upon the Small-Pox.

*Regimen* in the Simple-Diſtinct Small-Pox,

Stronger Diet.

In this *Simple-Diſtinct* Sort, the Patient ought to be allow'd a more ſtrengthening and more plentiful Diet, than in the other Kinds. His Broth may be made more nouriſhing, by the Addition of ſome Beef and Rice. He may even be permitted to eat Soup, when he has no Fever upon him. However, to prevent the Chyle furniſh'd by this Sort of Aliment from becoming ſowre, crude, or viſcid, he muſt be oblig'd to take, three or four times a Day, ſome one or other of thoſe *Abſorbent Draughts*, which are commonly, but improperly, ſtil'd *Cordials*. For all their Action conſiſts in abſorbing the ſowre Crudities, which might paſs out of the *Primæ Viæ* into the Blood, and either excite a Fever, or inſpiſſate the Juices to that degree, as to diſorder the common Courſe of the Diſtemper.

Abſorbent Draughts.

How theſe Draughts are to be made.

Each Draught ought to be made up of three or four Ounces of proper Liquors, ſuch as the *diſtill'd Waters* of *Scorzonera*, *Wild-Succory*, *Borage*, and *Orange-Flowers*; in which muſt be infus'd half a Drachm of Abſorbent Powder; to which may be added Extracts, Confections, and ſuch like. The Abſorbent Powders, which

I judge preferable to any other, are, *Coral*, *Crabs-Eyes*, *Pearl Powder*, *Powder of the Confection of Hyacinthe*, or that of the *Counteſs of Kent*. It is often neceſſary to add *Antimonium Diaphoreticum*, and ſometimes *Oriental Bezoar*, and the *Compound Bezoar* of *Dom Gaſpar Antonio*.

How made for Children.

When we have to do with Children ſubject to the Worms, or to Convulſions, or with ſuch as have greeniſh viſcid Stools, we prefer *Pulvis ad Guttetam*, *Oyſter-ſhells* or *Egg ſhells calcin'd*, to the Powders above mention'd.

Children muſt take theſe by Spoonfuls only; but to grown Perſons they muſt be given ſeveral times in the Day, by three or four Ounces at a time; for they are not to expect any Good from a ſmaller Doſe.

It muſt be noted, That Powders do far better in the Compoſitions of theſe Abſorbent Draughts than Confections. I have learnt from Experience, that theſe Powders are capable of abſorbing a greater Quantity of ſowre Crudities at one Doſe; beſides that they render the Draught leſs nauſeous.

If we find that the Puſtles do not fill as they ought; if the Circles at their Baſes turn pale, and the Pulſe becomes quick and low, there will be Reaſon to conclude that the Blood is thicken'd. What we have to do on this Occaſion, is to increaſe the Activity of the Potion; adding, by way of *Succedaneum*, either the *Antimonial Diaphoretick*, the *Counteſs of Kent's Powder*, or ſome Grains either of *Saffron* or *Theriaca*.

Clyſters.

If the Patient is coſtive, he muſt take Clyſters; eſpecially if he be full grown.

Narcoticks.

In caſe he is fatigu'd thro' want of Sleep, occaſion'd by the Pain and Uneaſineſs of the Small-Pox only; we need not ſcruple to give a ſmall Doſe of *Syrup of Diacodium*, or ſome other gentle *Narcotick*, in a Simple Water fit for this Purpoſe.

Theſe *Narcoticks* will loſe a great deal of their Virtue, ſhould they turn ſowre upon the Stomach. To prevent this Diſorder, let ſome Grains of an *Abſorbent Powder* be added. As to the Choice of the *Narcotick*, in this Simple-Diſtinct Sort, we think *Syrup of Diacodium* preferable to *Diaſcordium*, or *Theriaca*; becauſe the Effect of theſe depends upon the *Opium* contain'd in them.

Method of Cure during the Suppuration.

When the *Suppuration* begins, the Patient muſt be abridg'd of his Soup: However, if he ſtands in need of more ſubſtantial Nouriſhment, he may mix *Rice-Cream* in his Broth. He may even be al-

Food.

low'd Soup, if the Fever be moderate, and not attended with any conſiderable Symptoms: But when that is violent, we ſhall be forc'd to lay aſide the Uſe of Abſorbent Draughts, and to reduce him to his Chicken-Broth. He muſt drink plentifully of ſome light Ptiſan. Between the Paroxyſms, ſome proper *Apozems* muſt be preſcrib'd, made up of *a Decoction of Borage-leaves, of Bugloſs*, &c. with *Syrup of Maiden-hair, Colts-foot*, &c. Theſe Medicines quiet the Effervеſcence of the Blood, promote Perſpiration and Urine, without rendring the Belly coſtive.

Drink.

Apozems.

Method after the Suppuration.

After the Suppuration is over, the Patient may return to a ſtronger Diet, in caſe he has no Fever. He muſt continue the Uſe of his Ptiſan; the Abſorbent Draughts muſt be taken in leſſer Quantities; and he muſt have a Clyſter given him every Day.

Neceſſity of repeated Purges at the End of the Diſtemper.

When the Scabs are come off, he muſt be purged without Delay. This muſt be repeated twice or thrice, without waiting too ſcrupulouſly till the One and twentieth Day be paſt.

Notwithſtanding all the common Prejudices againſt it, 'tis abſolutely neceſſary to purge on this Occaſion as ſoon as poſſible: This is the ſureſt Method of preventing the ordinary Conſequences of this

Diſtemper; ſuch as Boils, Leprous Itch, a Feveriſh Diſpoſition, *&c.*

## METHOD *of Cure in the Malignant-Diſtinct Small-Pox.*

*Inflammatory Fever* the Cauſe of all the Danger in this Sort.

ALL the Danger of this Sort is owing to the *Inflammatory, or Malignant Fever*, which attends them throughout their Courſe: So that our principal Intention muſt be, to quiet this Fever, and to abate it in ſuch a manner, as that no Fatal Accidents may ſpring from it; which are moſt to be apprehended during the Suppuration. That Seaſon is always very dangerous of it ſelf; becauſe the Fever, and other Symptoms, are commonly very much increaſed.

*Method of Cure* before the Eruption.

Bleeding to precede all other Remedies.

To anſwer theſe Indications, the Phyſician muſt begin his Cure with Bleeding; the Choice of which he will regulate, according to the following Obſervations.

When to begin with Bleeding in the Arm.

*In caſe he has an Opportunity* at the very Beginning of the Eruption, or ſome Time before it, he will firſt order Bleeding in the Arm; in Compliance with the ordinary Prejudice againſt Bleeding in the Foot too haſtily.

Bleeding in the Foot, when abſolutely neceſſary.

*But if he is not call'd* till after that Time, he will preſcribe this laſt Sort of Bleeding without Delay, whatever Oppoſition he meets with.

If Bleeding in the Arm can be of any Uſe, it muſt be at the very Beginning of the Diſtemper; becauſe all that we then have to do, is to diminiſh the Plenitude of the Veſſels; and this it is very capable of. Bleeding in the Foot is equally proper, when we have no Prejudices to contend with: And beſides this Advantage which it has in common with that in the Arm, it has that of acting by Revulſion, with reſpect to the Veſſels of the Head. But this laſt Effect, ſo neceſſary in theſe Circumſtances, is never compleat, till the Blood-Veſſels of the whole Body have been well freed from their Plenitude.

After once or twice Bleeding in the Arm, we are oblig'd to have recourſe to the Foot, for Reaſons which have been already explain'd. In this Sort, the Fever of it ſelf cauſes thoſe Oppreſſions upon the Veſſels of the Brain, which the Nature of the Diſtemper renders ſtill more terrible and cruel. We may therefore, on this Occaſion (and I have often practis'd it with Succeſs) order the Patient to be twice or thrice bled in this Part. However, Prudence requires, that we ſhould regulate our ſelves according to the Height of the Fever, the Nature of the Symptoms, and the Strength of the Patient.

Vulgar Prejudices ought not to hinder the repeated Uſe of this Sort of Bleeding.

I am not ignorant, that Bleeding in the Foot cannot be repeated, without affrighting the Patient, and thoſe who are concern'd for his Preſervation. Frequent Bleeding in the Arm does not alarm them near ſo much; they look upon this as nothing in compariſon to the other. But a Phyſician, of equal Skill and Zeal for his Patient's Welfare, muſt not be influenc'd by their vain Terrors. And would to God, that all the happy Effects, produced by Bleeding in the Foot, in the *Malignant* Small-Pox, might once undeceive Mankind, and cure them of their ill-grounded Prejudices againſt it!

The Humours to be diluted.

During the Uſe of Bleeding, care muſt be taken to dilute the Humours, by cauſing the Patient to drink plentifully of a *Ptiſan* made of the *Root of Wild-Succory*, of *Gramen Caninum*, and *Liquorice*. He muſt take a *Diluting Apozem* every Three Hours, and muſt have his Inteſtines cleanſed of their Impurities, by ſuch *Clyſters* as we have preſcribed for the *Simple-Diſtinct* Sort. In the mean while, our principal Attention muſt be fix'd upon the Fever, to watch narrowly the Time of its Dimunition, and the End of its Paroxyſm, in order to lay hold on that Opportunity, for the giving ſome *Cathartic.*

It muſt be taken as an Axiom in Phyſick, that in Malignant Fevers, the Humours are viſcous and indigeſted; that the *Primæ Viæ* are ſtuff'd up, and the Glands infarcted by them.

The Neceſſity of Vomits.

This Principle once receiv'd, ſhews by neceſſary Conſequence that we muſt have recourſe to *Emetics*, which diſcharge the Glands, and evacuate them without Irritation. That which we commonly prefer to any other, is, *Sal Stibii Solubile*, whoſe Doſe is to be proportion'd to the Age and Strength of the Patient, and to the Nature of the Diſtemper.

*Sal Stibii Sol.* preferable to any other Emetic.

How to give it.

Our common Practice is to give this Medicine alone, diſſolved only in pure Water, or ſome convenient diſtill'd Water, without any Mixture of a *Cathartic* with it. Otherwiſe it would often happen, that the Patient inſtead of being vomited, would be evacuated downwardly, which would deſtroy in a great Meaſure the Efficacy of the Medicine.

Precautions in the Uſe of it.

We are of Opinion it ought never to be preſcribed, till after the Blood-Veſſels have been empty'd by Bleeding. It is of no leſs Importance to regulate the Doſes in ſuch a Manner, that they may not produce too violent Efforts and exceſſive

Vomiting. Without theſe Precautions, the Blood being impell'd with too much Rapidity, and in too great a Quantity into the Veſſels of the Head, might either ſurcharge and dilate them conſiderably, or even burſt them there.

Vomiting to be ſucceeded by a gentle Purge.

An exact and minute Attention to the State and Circumſtances of the Diſtemper, will ſhew the Phyſician how far the Evacuations ought to be carry'd. To render them ſufficient, we commonly ſupport *the Action of the Emetic*, by the *Aſſiſtance of ſome gentle Purgative*, which we give Three or Four Hours after. I do not judge it proper to continue the Effect of this laſt by *Diluters*, render'd *Cathartic*. For I think I have before obſerv'd, that by this Means we only diſcharge mere ſerous Humours, and conſequently rob the Juices of their aqueous Part. However, the Evacuation here mention'd, by Vomiting and Purging, is abſolutely neceſſary in order to facilitate the Secretions, and to put the crude indigeſted Humours in a Capacity of being diſſolved, and of arriving at that State of Coction upon which the Succeſs of all Evacuations depends.

*Diluters* made Purgative to be forborn.

Abſorbents after Purging.

When the Purge ſhall have ceas'd working, the Patient muſt take every Three Hours a *Draught* made up with *Coral*, *Crabs-Eyes*, and *Pearl*. The Effect of this will be, to abſorb the ſowre Juices, which diſtil continually into the *Primæ Viæ*, and to hinder them from paſſing into the Blood, and communicating their Ill Quality to it. By this Means the indigeſted Humours in the *Lympha* are divided and attenuated, ſo as to acquire that thinneſs and fluidity, which will give a good Effect to the Evacuation that is to ſucceed.

Either Vomiting or Purging to be repeated, when the Humours have been thinn'd.

If we judge that theſe are ſufficiently thinn'd, and that they do not abound too much, we may content our ſelves with ordering a Purge only. But if we ſee a Neceſſity for vomiting, we muſt repeat our *Emetic*, either mix'd with a Purgative, or ſingly and diſſolv'd in Water, reſerving the *Cathartic* till ſome Hours after; according as there ſhall be need of a greater or leſs Evacuation.

Accidents prevented by this Means.

By evacuating the Humours, with which the *Lympha* is replete, we quiet or diminiſh the Paroxyſms of the Fever; we prevent the profuſe Colliquative Sweats, the Hæmorrhages, Suppreſſions of Urine, and other Accidents, which often befal this firſt Sort of the Malignant Small-Pox.

*Febrifuge Ptiſan* in certain Paroxyſms.

I have ſometimes obſerv'd, the Paroxyſms of the Fever were denoted at certain Hours by Cold Fits and Yawning. On this Occaſion, I have uſed with good ſucceſs a *Febrifuge Ptiſan* made of the *Cortex*, and the Leaves of *Borage and Bugloſs*; taking care however not to give it, but when the Skin was not hot, nor the Tongue dry, *&c.* This *Ptiſan* muſt be continued no longer than the Fourth Day, for fear of giving too violent a Motion to the Blood and Juices; which are but too much agitated in the time of Suppuration.

Neceſſity of the early Uſe of Bleeding, *&c.*

It is not enough to have been thus particular concerning the Method to be obſerv'd in the Uſe of Bleeding, Vomiting, Purging, and other Remedies; which alone are capable of oppoſing and vanquiſhing the Fever, that inſeparable Attendant of the *Malignant* Small-Pox. I think my ſelf oblig'd to dwell upon the Neceſſity we lie under, of having recourſe to theſe at the very firſt, without the leaſt delay. We have but a few Days to apply them in. 'Tis therefore ſcarce poſſible to be too haſty in a Time ſo urgent: They muſt follow each other as cloſe as may be, without running any hazard.

Occaſions requiring frequent Bleeding to be followed immediately by Vomiting and Purging.

We are often forc'd to bleed the Patient Twice or Thrice in one Day, and to purge him the Day after: Nay, we are ſometimes conſtrain'd to give him a Purge or Vomit within a few Hours after his laſt Bleeding. The Violence of the Symptoms,

toms, the Swiftneſs of their Aggravation, the exceſſive Height of the Fever, and the quick Succeſſion of its Paroxyſms, are Motives which oblige the Phyſician to crowd all his Sails.

These Remedies, if neglected at firſt, to be recurr'd to at the Beginning of the Eruption.

Theſe ſeveral Means, how efficacious ſoever in preventing an Inflammation of the Brain, yet never operate with that Certainty, as when they have been employ'd before the Eruption. But if the Patient has not been ſo happy as to procure them in that time; they muſt be put in Practice at leaſt at the Beginning of the Eruption, even during the three firſt Days. 'Tis true, the Event is then much more dubious; but I never found that they had any evil Conſequences, though uſed thus late, and in theſe Circumſtances.

Symptoms then cauſed by them.

I have only remarked, that when Bleeding, Vomiting and Purging did not take place till after the Eruption was begun, it has happen'd, that,

1. *The Circle at the Baſis of each Puſtle* was paler than ordinary, during the firſt Days.

2. *The Eruption was ſlower*, and the Pocks did not come out, nor riſe ſo quickly.

It is not difficult to account for theſe Circumſtances.

*The*

Reaſon of the firſt Symptom.

*The Paleneſs of the Circle* proceeds from a leſs Quantity of the Blood, in the Lymphatic Veſſels of the Part where the Puſtle is form'd, *i. e.* from the Inflammation's being leſs violent.

Reaſon of the Second.

*The Puſtles come out and riſe more ſlowly*, becauſe the Evacuations have carry'd off, through the Glands of the Inteſtines, part of the Humour which would otherwiſe have been derived to them. But when the Action of the Purgative is over, the Motion of the Blood quickly throws a ſufficient Quantity of this Humour upon the Glands of the Skin; Perſpiration is promoted; and if Nature does not take this Courſe of herſelf, 'tis eaſy to determine her to it.

A Phyſician ought not to be ſurprized at this Delay; if it is not attended with other Accidents, I think it cannot but be advantageous. 'Tis very happy, when the Eruption is ſo ſlow and gradual.

Inconvenience of too haſty an Eruption.

When it is too haſty; when the Puſtles riſe and fill all at once, the too violent Motion of all the Fluids, and the too great Plenty of the Humours getting looſe as it were in an Inſtant, always threaten ſome of the *Viſcera* with an Inflammation. Beſides, the Patient ſuffers leſs, when the Skin is but moderately inflamed.

Advantages of of a ſucceſſive gradual Eruption.

In ſhort, when the Puſtles come out and fill ſucceſſively, there are fewer of them to ſuppurate at one time. The Suppuration is carry'd on inſenſibly: The Fever which it cauſes is leſs violent; the Agitations, Reſtleſſneſs, and Averſion to Sleep, leſs conſiderable; and the Diſtemper goes off with more Tranquillity.

What to be done after ſufficient Purging.

When the Evacuations produced by the Purges ſhall have been ſufficient, ſo as that the Nature of the Paroxyſms does not require the Uſe of the *Febrifuge Ptiſan* above-mention'd, we muſt obſerve a different Conduct.

Blood to be diluted.

Our primary Intention muſt be to dilute the Blood; to carry off through the Urinary Paſſages part of the Salts, with which 'tis too highly impregnated; to keep up a gentle and plentiful Perſpiration, and to preſerve the Solubleneſs of the Belly; and laſtly, to diſcharge, through different Strainers, a good Quantity of the Humours contain'd in the *Lympha*.

Perſpiration, and Solubleneſs of the Belly to be kept up.

Medicines proper for theſe Intentions.

For theſe Purpoſes, we muſt order the Patient four or five Ounces of a light Decoction of cooling Plants, ſuch as *Borage*, *Bugloſs*, *Scolopendrium*, and *Wild Succory*, to be taken every three or four Hours in his Broth. With each *Apozem* muſt be mix'd twelve or fifteen Grains of *Diaphoretic Antimony*; and to take off the Diſagreeableneſs of the Taſte, let a little

*Apozem.*

*Diaphoretic.*

*Syrup of Maidenhair*, or ſuch like, be added. This *Diaphoretic* is an excellent Remedy. It breaks and atenuates the crude and groſs Part of the *Lympha*, without cauſing any Heat or Inquietude. It renders the Perſpiration more plentiful, without diminiſhing the Quantity of Urine. It keeps the Body open, without producing crude and ſerous Stools. The Experience which I have had of this Medicine, hath often engaged me to uſe it in the *Simple-Diſtinct* Sort; when being call'd too late to be able to purge before the Eruption, I have found no Symptom which required the Uſe of *Cathartics*.

Its good Effects.

How to render the *Apozemes* Purgative.

If theſe *Apozems* do not looſen the Body ſufficiently, we may have recourſe to *Purgative Clyſters*. But I have obſerved, that the moſt effectual Method was to diſſolve, in four of theſe Apozems, of three or four Ounces each, two, three, or four Grains of *Sal Stibii Solubile*, according to the Strength of the Patient, and the Neceſſity of purging more or leſs abundantly. This Medicine, which we have always uſed with Succeſs in the *Malignant* Small-Pox, eſpecially in the *Confluent* Kinds, may be taken twice, thrice, or four times a Day. Its Action is very gentle; the Evacuations which it produces are always Bilious, and do not in the leaſt diminiſh either thoſe by Urine or

Perſpiration. It may be uſed the firſt Days of the Eruption; and even continued till the Suppuration begins. There is no reaſon to fear its ſtopping or delaying the coming out of the Puſtles, or the Progreſs which they ought to make. I have likewiſe obſerved, that it abated the Fever of Suppuration.

Other Medicines, when the Body is too open.

*When the Body ſhall be too open*, the Doſes of the *Sal Stibii*, and *Diaphoretic Antimony* muſt be leſſen'd, or wholly taken away; their place in the *Apozems* ſupply'd by *Coral*, *Crabs-eyes*, or *Calcined Harts-horn*; or even a ſmall Doſe of *Aſtringents* may be added.

Abſorbents againſt a violent Looſeneſs.

*Laſtly*, *if the Looſeneſs is exceſſive*, inſtead of a Decoction of the Plants abovemention'd, we muſt uſe the diſtill'd Waters of *Scorzonera*, *Plantain*, &c. Nevertheleſs, I have found the Juices of Plants more efficacious, and better ſuited to the Intentions of keeping up the Perſpiration, and of promoting Urine, without reſtringing the Belly.

Reſtrictions concerning the uſe of Abſorbents.

Though it may not be amiſs to make uſe of *Abſorbents* upon theſe Occaſions, (as we have obſerv'd) yet a Looſeneſs is not always a dangerous Symptom. And, therefore, before we go about to ſtop it, we ought to attend to the Quality of the Evacuations, and the Time in which it happens.

*If the Looſeneſs begins after the Eruption*, and immediately before the Suppuration, or whilſt that ſhall laſt; if it diſcharges a crude, ſerous, and greeniſh *Ichor*; it muſt be ſtopp'd gradually, by correcting the ill Quality of the Juices which produce it. Nothing can be more ſuitable to this Purpoſe, than the *Abſorbents* above-mention'd; to which may be added the Confection of *Cajou*, or a little *Theriaca*, provided the Head be in no wiſe affected. *The Counteſs of* Kent'*s Powder*, *Oriental Bezoar*, and a *Ptiſan of Lentils*, are of equal Uſe.

Medicines to be added to the above-mention'd.

*The Looſeneſs happens ſometimes before*, or at the Beginning of *the Eruption*. If the Stools are crude and ſerous, we muſt not make uſe of *Abſorbents* at firſt. Theſe are not to take Place till after the Patient has taken a Purge, in order to diſcharge the Humours contain'd in the *Primæ Viæ*, whoſe Malignity keeps up the *Diarrhœa*.

*On the other Hand, if the Stools are bilious and laudable*, if they do not obſtruct the Eruption, nor hinder the Puſtles from filling; and laſtly, if the Fever does not become more intenſe, there is nothing to be fear'd from a Looſeneſs. So far from being dangerous, it will indeed be Salutary; even though it ſhould happen at the time of Suppuration. However, it may be moderated in Caſe it becomes exceſſive. But if it ſhould afterwards ſtop too ſuddenly, it muſt be revived by the Help of *Apozems*, or other ſuitable Medicines.

I am likewiſe of opinion, in caſe the Patient's Belly is inflated, if he has troubleſome Motions there, and is reſtleſs and uneaſy, that, in any time of the *Malignant Diſtinct* Sort, even during the Suppuration itſelf, it may be very ſafe to give him *Clyſters*, either of mere Water, or made of proper Decoctions. If it be neceſſary, they may be render'd *Cathartic*, by the Addition of *Caſſia*, the *Fine Lenitive*, or *Catholicon Duplex*, &c.

*Clyſters* given throughout the Diſtemper.

In this Sort of the Small-Pox, the Patient muſt drink plentifully. Inſtead of the *Ptiſan* preſcribed above, I often uſe *Rice-Water*; in order to cool the Blood, and temper its Motion. With the ſame Intention I order ſome Spoon-fulls of *Rice-Cream* in the Patient's Broth; which muſt be either of *Veal* or *Chicken*, and given him every three or four Hours.

*Rice-Water.*

*Rice-Cream* in Broth.

The too violent Agitation of the Blood, the Eruption, the Pain occaſion'd by the Puſtles being preſs'd and lain upon; and laſtly, the Suppuration, frequently rob the Patient of his Reſt, and produce Watchings, Inquietude, *&c.*

Inquietude, and want of Sleep, *&c.* how to be allay'd.

Moderate *Narcotics.*

To quiet theſe Accidents, a ſmall Doſe of the *Syrup of Diacodium* may be given. But this muſt only take Place when the Patient's Head is free from all Oppreſſion; when he is neither ſubject to *Deliria*, nor Convulſions; to Giddineſs, nor Dozing; and when his Reſtleſneſs and want of Sleep are not occaſion'd by the Violence of the Fever. In theſe Circumſtances, all *Narcotics* muſt be forborn; and tryal only made, what *Syrup. de Nymphæâ* will do for him. But if his want of Sleep is exceſſive, ſo that ſome *ſtronger Narcotic* is abſolutely neceſſary, I think *Theriaca*, or *Laudanum Liquid. Sydenhami*, ought to be preferr'd, or ſome other Compoſition, ſo highly *Aromatic*, as to have the *Opium* ſufficiently corrected. For I have frequently obſerv'd, that *Opium* and Syrup of *Diacodium*, taken alone and without Mixture, have thrown the Patient into a Comatoſe Diſpoſition, and increaſed his Deliriouſneſs.

Circumſtances wherein they are hurtful.

When to make uſe of ſtronger Narcotics.

Method of Cure during the Suppuration.

When the Suppuration begins, the *Antimonium Diaphoreticum* muſt be retrench'd, or its Doſe much leſſen'd. The *Apozems* muſt be continued without any Addition to them; except of ſome *Terrene Abſorbent*, as *Coral*, &c. in caſe their turning ſowre upon the Stomach ſhould be apprehended. It is during the Suppuration chiefly, that the Patient muſt be al-

low'd

low'd to drink in larger Quantities; and as to his Broths, they muſt be no other than thoſe directed above.

Symptoms which give Reaſon to fear the Head was obſtructed from the Beginning.

It muſt be noted, that the *Deliria*, Convulſions, and other Symptoms which happen during the Suppuration, are commonly mortal when they come to a certain Pitch. We ſhall then have too much Cauſe to fear, that an Obſtruction hath been form'd in the Glands and Lymphatic Veſſels of the Brain, from the very Beginning of the Diſtemper. When we are ſo happy as to foreſee theſe Diſorders, there is no Remedy ſo effectual for their Prevention, or ſo likely to avert their fatal Conſequences, as *Bliſters*. Theſe muſt be apply'd twelve or fifteen Hours at leaſt, before theſe Symptoms become Intenſe. On theſe Occaſions I have often try'd Bleeding and Vomiting; but have rarely found them ſucceſsful.

Bliſters.

Cure after the Suppuration.

If the Paroxyſms of the Fever, or the other Symptoms, continue after the Suppuration is over, or when the Puſtles begin to dry up, we may uſe the abovemention'd Remedies. *Emeticks* and *Purgatives* have always ſucceeded well againſt thoſe Symptoms which were to be contended with, without any regard to the Small-Pox. Now when the Suppuration is compleated, there is no longer any Reaſon to be apprehenſive of the Diſtemper it ſelf: For the Variolous Matter in the Puſtles is then either wholly dry'd up, or ſo incraſſated, as to be incapable of returning into the Maſs of the Blood.

How to abate the Fever of Suppuration depending on the Quality of the Purulent Matter.

When this Matter is too thin and clear, the Puſtles dry up but ſlowly; which prolongs the Fever of Suppuration. This Fever, which has no Signal Paroxyſms, proceeds from the too liquid and ſaline State of this Humour, ſome of whoſe Particles get into the Blood. On this Occaſion we muſt open the Puſtles throughout the Body, that the Purulent Matter may be let out; which Operation alone is commonly ſufficient to extinguiſh the Fever. However, we muſt have recourſe to *Purgatives*, and *Cooling Medicines*, in order to allay the Ferment of the Blood, and to diſcharge the groſs Salts, with which it is ſtill impregnated.

* * *

SECOND

## SECOND SORT *of the Diſtinct-Malignant.*

Puſtles few.

IN this Sort the Puſtles are always few in Number: It is always attended with a Malignant Fever; which is indeed the principal Diſeaſe, the Small-Pox being no more than Symptomatical. Wherefore we ſhall forbear laying down any Method of Cure for this Species; for that muſt be the ſame with the Method for Malignant Fevers, which may poſſibly be the Subject of another Work.

Malignant Fever the principal Diſeaſe.

## *The* SIMPLE-CONFLUENT *Small-Pox.*

This Sort leſs dangerous than the Diſtinct-Malignant.

Greateſt Danger at the Time of Suppuration.

THIS Sort is far leſs terrible than the *Diſtinct-Malignant:* Nevertheleſs the Patient is often in great Danger; particularly during the Suppuration. For when the Humour contain'd in numberleſs Puſtles, comes to be converted into a *Pus*, the Blood is rarefy'd prodigiouſly, and frequently cauſes Obſtructions in the Lymphatic Veſſels of the Head, and forms a violent Inflammation there. Nay, ſometimes theſe are ſo exceſſively dilated, as to burſt: Immediately the extravaſated Blood cauſes an Apoplexy, and kills the Patient in an Inſtant.

Symptoms moſt to be dreaded.

The firſt Precaution againſt theſe dreadful Accidents, is, to bleed the Patient ſeveral times at the Beginning of the Diſtemper. If he is of a very Sanguine Conſtitution, and above twenty Years of Age, he muſt be firſt let-Blood once or twice in the Arm, and then in the Foot; which we need not ſcruple to repeat, conſidering the exceſſive Dilatation of the Veſſels within the Head.

How theſe to be guarded againſt.

Repeated Bleeding in the Arm or Foot.

Purging and Vomiting muſt ſucceed in the next Place: For they are no leſs neceſſary than Bleeding, in this Sort of the Small-Pox, where it is of ſo much Importance to diſcharge Part of the indigeſted Humours, which abound in the Veſſels and Glands. 'Twill be of great Advantage to purge a ſecond time, if the Circumſtances of the Patient allow and require it. But we muſt obſerve this Reſtriction: If we have a Fever, diſtinct and independent, (as in the *Malignant* Sorts)

Purging and Vomiting.

Sorts) to contend with, the Evacuations muſt be leſs abundant.

Indications of Cure after theſe.

After having ſufficiently diſcharg'd the Sanguinary Veſſels by Bleeding, and exonerated the Blood and *Primæ Viæ* of their Viſcid Crudities by Purgatives and Emeticks; we have theſe Primary Intentions to ſatisfy.

Blood to be diluted.

*Firſt*, To dilute and thin the Blood, that it may not expand, at the Time of its Suppuration, to an exceſſive Degree.

Urine promoted.

*Secondly*, To promote a Flux of Urine, and by that means to ſupply the want of Perſpiration, which is always very great on this Occaſion.

The Bile attenuated.

And, *Thirdly*, To attenuate the *Bile*, and to give it that Fluidity, which is requiſite to its eaſy Secretion thro' the Glands of the Liver. For I have obſerved that, in the *Simple-Confluent* Kind, no Parts were ſo ſubject to Obſtructions as theſe Glands. Whence, at the Time of Suppuration, do often ariſe irregular Paroxyſms of a Fever, Hæmorrhages, Vomitings, Faintings, *&c.*

Medicines anſwering theſe Indications.

To anſwer theſe Indications; As ſoon as the Patient ſhall be purg'd, let him take, betwixt his Broths, a *Diluting Apozem*,

*zem*, made of the Decoction of the Leaves of *Borage*, *Bugloſs*, *Scolopendrium*, and *Wild-Succory*. In four Ounces of this Decoction, muſt be mix'd fifteen or twenty Grains of *Antimonium Diaphoreticum*, and half a Grain or a Grain of *Sal Stibij ſolubile*, as hath been preſcrib'd above.

When the Suppuration begins, the Antimonials muſt be retrench'd, and the above-mention'd Decoction only uſed. However, if its turning ſowre on the Stomach be apprehended, *Coral*, *Pearl*, &c. muſt be added; and this Method obſerv'd till the Suppuration is finiſh'd.

It ſometimes happens during the Eruption, that the Puſtles do not riſe ſufficiently, and are flat and ſunk in their middle: In this Caſe, inſtead of the *Sal Stib. ſolub.* let *Antimon. Diaphoret.* alone be uſed; and if this does not raiſe the Puſtles, let a ſmall Doſe of *Kermes Mineral* be added, or *Pulv. Com. Cant.*; or elſe *Species Confect. Hyacinth.* &c.

When the Urine is thick, of a flaming deep Yellow, and comes in ſmall Quantities only, we muſt have recourſe to *Sal Mirab. Glauberi*. The Method in which it ought to be given, is as follows. If the State of the Patient will permit the Diſuſe of the Teſtaceous Powders, it may be taken in the Apozems: But if the Abſorbents cannot be omitted, 'twill be better to diſſolve it apart in ſome other Liquor, as the Broths, or Ptiſan. The Patient muſt take it betwixt his Cordials; and theſe Medicines thus ſeparated, will act the more powerfully.

Effect of Clyſters.

Clyſters are of great Service in the Simple-Confluent Small-Pox: So far from hindring Perſpiration, or bringing on Looſeneſſes, I have found them very uſeful towards their Prevention. Beſides, there is a Neceſſity for evacuating the Inteſtines; for when the Humours are ſuffer'd to abide there, they raiſe an Efferveſcence, and bring on Cholicks, *Diarrhœa's*, and other dangerous Symptoms.

*Regimen.*

As to the *Regimen*, the Tendency of it, as well as of the Medicines, ought to be to dilute and cool the Blood; and therefore the Patient's Nouriſhment, throughout the Courſe of the Diſtemper, muſt be only Chicken or Veal-Broth; with which may be mix'd ſome Spoonfuls of *Rice-Cream*. His ordinary Drink muſt be a Ptiſan of the Roots of *Wild-Succory*, or *Scorzonera*.

Change of Method, in caſe of Foreign Symptoms towards the End of the Suppuration.

This is the Method which, I think, ought to be obſerved during the Ordinary Courſe of the *Simple-Confluent* Small-Pox; that is to ſay, when they are not attended with Foreign Accidents. But, towards the Concluſion of the Suppuration, we often meet with an acute Fever, *Hæmorrhagies*, Convulſions, *Coma's*, Faintings, Swoonings, Vomitings, *&c.* Then are we obliged to purſue a different Courſe.

If the Patient has not been ſufficiently bled and purged at the firſt; if theſe Symptoms did not appear at the Beginning of the Diſtemper, nor ſome Time after, they can only be aſcribed to the Rarefaction of the Blood, occaſion'd by the Violence of the Fever, or by the Suppuration. It will therefore be abſolutely neceſſary to bleed in the Foot immediately; even tho' the Puſtles are ſtill a ſuppurating. This is the only way to hinder the Blood from being expanded, from forcing into the Lymphatic Veſſels of the Brain, from diſtending, and afterwards burſting them; in which Caſe, indeed, there will be no need of Bleeding.

According to this Principle, it ought to be repeated without Scruple, if the Symptoms require it. At the ſame Time, let *Diluting Apozems* be order'd, which may be made gently purgative if there be Occaſion.

If theſe Symptoms are preceded by a regular Cold-Fit, we muſt give the *Febrifuge Ptiſan*, compoſed of the *Bark*, *Borage-Leaves*, &c. But this muſt not be till after the Bleeding, and when the Fit is much abated, leſt the *Cortex* ſhould put the Blood into too great a Ferment.

In caſe the Patient is troubled with Reachings, Faintings, Eructations, an Inflation and Oppreſſion at his Stomach; he muſt take a Vomit after he has been let Blood: Obſerving never to give him this, but when the Abatement of the Fever, and the End of the Paroxyſm will admit it.

On the other hand, if the Symptoms have been allay'd by Bleeding, and Diluting Medicines; we ſhall chuſe to wait the End of the Suppuration, before we uſe *Purgatives* and *Emeticks*.

The above-mention'd Symptoms oft-times do not appear, till the Puſtles are dry'd up, and the Suppuration quite over. In this Caſe, let the Patient be purg'd or vomited, immediately after he has been let Blood, in order to take off the Fever and its concomitant Symptoms. I have never found this Practice to fail.

Bleeding, &c. to no Purpoſe, in caſe theſe Symptoms appear'd at firſt.

But it muſt be obſerved, that this would be very impertinent, if theſe Symptoms had appeared at the Beginning, or during the Courſe of the Diſtemper. There is nothing to be hoped from this Method, when the Glands of the Brain have been imperceptibly obſtructed from the very firſt, in Spite of Bleeding and Purging.

In theſe Circumſtances, it will be in vain to bleed the Patient; he will find no Relief from it.

Bliſters to be apply'd in this Caſe.

*Bliſters* are then the only Remedy on which we can have any Dependance; and yet theſe are of no Effect, unleſs apply'd Twelve or Fifteen Hours before the Symptoms arrive at their Height. Beſides the Difficulty of diſcerning, and laying hold upon the favourable Moments, for the Application of this Remedy, often renders its Operation very uncertain.

It remains that we here make one general Obſervation, *viz.* that the Accidents, which ſometimes come on towards the End of this *Simple-Confluent* Sort, are not always owing to an Oppreſſion upon the Lymphatic Veſſels of the Brain form'd at the Beginning. Their ordinary Cauſe is, the Want of due Bleeding and Purging at firſt; or an improper *Regimen* during the Courſe of the Diſtemper; or the pernicious Uſe of Wine and hot Cordials. Hence it comes that Bleeding, which we are ſometimes forc'd to order after the Suppuration, does frequently ſucceed better in this, than in the *Malignant* Sorts. The Reaſon of which Difference is, that in the laſt mentioned all the Symptoms (let them appear when they will) are to be aſcribed to nothing but the Oppreſſion of the Lymphatic Veſſels of the Brain, which were overcharged from the Beginning.

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## *The* MALIGNANT CONFLUENT SORT *called Cryſtalline.*

**Whence the Name of *Cryſtalline.***

THE Thinneſs and Clearneſs of the Humour, contain'd in the Puſtles of the Second *Species* of the *Confluent* Small-Pox, has occaſioned their having the Appellation of *Cryſtalline*. This *Pellucidneſs* of the Variolous Humour; the reddiſh *Paleneſs* of the Circles at the Baſes of each Puſtle; the *OEdematous Tumour* of all the Parts, are the *Diagnoſticks* of this Sort.

**Principal Symptoms.**

**State of the Blood.**

Theſe plainly ſhew the too fluid and broken *Craſis* of the Blood; and that conſequently, it cannot rarefy and expand, in ſuch a Manner as it might, were it thicker and more abounding with *Sulphur*. It yields more eaſily to the Motion of the Solids, and wants Force to diſtend them exceſſively. So that there is no Occaſion to bleed ſo much as in the other Sorts; ſince an Obſtruction of the Veſſels, and an Inflammation are much leſs to be apprehended.

Much Bleeding not neceſſary.

Where the greateſt Danger lies.

Nevertheleſs this Diſeaſe is very dangerous; for the Blood is very much diſpoſed to a fatal Diſſolution; to prevent which, muſt be the firſt Care of the Phyſician. And ſeeing that the Head is always affected, it is our Practice, in order to relieve it, to preſcribe Bleeding in the Foot, which we ſeldom or never repeat.

Bleeding in the Foot, not repeated.

*Looſeneſs* one of the Chief Symptoms.

One of the Principal Symptoms, that appear at the Beginning of the *Cryſtalline* Small-Pox, is a violent Looſeneſs, whoſe Stools are crude, ſerous, and of a greeniſh or whitiſh Colour. This can be aſcribed to Three Cauſes only, *viz*;

Three Cauſes of it.

*To the Diſſolution* of all the Juices.

*To the Relaxation* of the Glands.

*To a Quantity* of ſharp Humours, contain'd in the Glands, and in the *Primæ Viæ*. Theſe Humours which abound very much, corrupt the Aliment and the Ptiſans themſelves, and turn them ſowre; by which Means the Looſeneſs is obſtinately kept up.

Firſt Intentions.

To avert its hurtful Conſequences, we muſt firſt apply our ſelves *to diſcharge the Humours out of the* Primæ Viæ; *to reſtore their loſt Tone to the relaxed*

*Glands*; and laſtly, *to give a greater Conſiſtency to all the Juices.*

Remedy anſwering theſe Intentions.

Upon this Foundation, we muſt begin with vomiting the Patient. But for fear of cauſing too great Evacuations, it muſt be given in a very ſmall Doſe; and Care taken to mix it with ſuch other Medicines, as may hinder it from working downwards too much, and as are proper to ſtrengthen and contract the Glands. In Purſuance of theſe Intentions we may preſcribe, to ſtrong Conſtitutions, Two or Three Grains of *Sal Stibij Solub.* diſſolved in *Carduus*, or *Orange Flower-Water*, or in *Barley Cinnamon Water*, to which may be added ſome Drops of *Lilium.* But from many ſucceſsful Tryals, I think I have Reaſon to prefer a *Potion*, made up of one Ounce *Syrup. Magiſtralis* with Ten or Twelve Grains of *Hypecacuana*; the whole mixt with ſome Ounces of the *Spirituous Cordial Waters* abovementioned. Theſe Potions never occaſion too plentiful Evacuations. They carry off the ſharp crude Humours in the *Primæ Viæ*, which might otherwiſe communicate their ill Quality to the Aliment, the Drink, and to the Medicines themſelves; and by that Means continue the Looſeneſs.

*Bolus*'s after the *Emetick.*

When this *Emetic* ſhall have ſufficiently evacuated the Patient, he muſt take in his Broth, *Bolus's* made of *Coral*, *Pearl*, *Crab's Eyes*, *Species Confect. Hyacinth. calcined Harts-Horn*, *Chalk of Briançon*, &c. Theſe will abſorb whatever ſowre Juices are left in the *Primæ Viæ*, and will abate the Dejections.

Gentle aſtringent Purge.

A Day or Two after, if it be neceſſary, you may order him a gentle aſtringent Purge. ſuch as *Syrup. de Cichor. cum Rhabarb*, *Syr. Magiſtralis*, or the *Catholicon Duplex*, &c. with ſome Grains of *Hypecacuana*, to correct the Sharpneſs and Crudities of the Humours, and to ſtrengthen the Tone of the Glands.

Dangerous to ſtop the Looſeneſs wholly.

Some little Time after this ſtrengthening Purge, the Patient muſt begin with *Draughts* made up of *Plantain*, *Centinodium*, *Barley Cinnamon Waters*, and the *Abſorbents* abovementioned. If theſe are not ſufficient to moderate his Looſeneſs, a ſmall Doſe of *Cortex Granatenſis*, *Cajou*, or other Aſtringents, may be added; for great Care muſt be taken, not abſolutely to ſtop the Flux, but only to quiet it.

Circumſtances in which it is not Prejudicial.

Indeed, provided it be not too violent, if it does not hinder the riſing and filling of the Puſtles, nor the Parts from Swelling; and if other Accidents are not occaſioned by it, we ought not to look upit as Prejudicial.

How to be revived in Caſe it is ſtopp'd.

If it ſhall happen to ſtop entirely, or even to be too conſiderably abated, ſo as that the Belly becomes inflated, we muſt renew it by the Help of gentle Clyſters, and muſt forbear all Medicines which in any wiſe oppoſe it.

*Syr. de Nymphea* the only *Narcotick.*

If the Violence of the Symptoms deſtroys the Patient's Reſt, and requires ſome *Narcotic*; no other muſt be uſed but *Syrup. de Nymphea.*

*Method of Cure* towards the End of the Suppuration.

This is the Method which we purſue in the *Cryſtalline* Small-Pox, till the Suppuration draws towards a Concluſion. Then, if a Fever appears, or the *Diarrhœa* ſtill continues, we are to have recourſe *to proper Purges.* But theſe muſt be deferr'd longer than in the other Sorts; becauſe in this, the Variolous Humour is longer in coming to its Conſiſtency.

Laſtly, to hinder this Humour from mixing with the Maſs of Blood, and by that Means keeping up the Fever, we muſt take care, as ſoon as the Suppuration is over, to cut the Puſtles upon the Arms, Hands, and all over the Body, except the Face and Head.

*Total Solution* of the Juices the moſt fatal Symptom to be contended with.

From the Beginning to the End of the Diſtemper, we muſt keep a watchful Eye upon that *Diſſolution*, which threatens all the Fluids. To prevent this; to give the Juices their due Conſiſtency, and to bridle their Saline Particles, without running the Hazard of ſuppreſſing, or even diminiſhing the Urine and Perſpiration; we muſt preſs the Obſervation of the following *Regimen*.

*Regimen* for this Purpoſe.

The Patient's *Broth* muſt be made of a *Calf's Head* and *Veal-Cutlets*, with a little *Beef*, and a good Quantity of *Rice* or *Barley*. He muſt drink very plentifully of a *Ptiſan* made of *Lentils*, to which, in order to make it more aſtringent, may be added ſome Leaves of *Roſes de Provins*: Or inſtead of this *Ptiſan*, and with the ſame Intentions, he may uſe the *Decoctum Album Sydenhami.* But in the room of the *Cruſt of Bread*, the Yeſt or Leven of which may be prejudicial, I think that ſome *Rice* ought to be ſubſtituted.

*Emulſions* improper.

*Emulſions* ſeem very proper to ſweeten and agglutinate the Juices. However, I am of Opinion, that neither they, nor the Draughts compoſed of Almonds, and the Cold Seeds, are fit to be uſed on theſe Occaſions.

They lie very heavy upon the Stomach; and are apt beſides to turn ſowre in the firſt Paſſages, ſo as to increaſe the the Looſeneſs and the Fever. For which Reaſon, *Lentils*, *Pearl-Barley*, *Rice*, &c. which produce very good Effects, without

out being liable to theſe Inconveniences, are far preferable to them.

Acid Draughts to be avoided.

There are other *Draughts* made of *Lettice*, and *Purſlain-Waters*, &c. of *Spirit of Sulphur*, or *Spirit of Vitriol*, *Syr. of Lemons*, *Barberries* and other *Acids*, which skilful Phyſicians have been accuſtomed to order in the *Cryſtalline* Small-Pox. I have often experienced theſe, and far from finding them preferable to the *Abſorbents* and *Agglutinants* here propoſed, I think they are not near ſo efficacious.

Their Inconveniencies.

They are not ſo proper to cloſe the Glands of the Inteſtines, and conſequently to reſiſt the Violence of the *Diarrhœa*.

Moreover, their Acidity upon which all their Operation depends, is communicated to the Patient's Aliment. So that the Chyle form'd from thence wants that unctious Inſipidneſs, ſo neceſſary to agglutinate the Juices, and to ſtock the Blood with Earthy and Sulphureous Particles, of which it is then deſtitute.

Reflections concerning two Sorts of Draughts.

There are Two Reflections, which I cannot omit upon this Occaſion.

We muſt never allow our Patients the Uſe of *mucilaginous emollient Drinks*, at the ſame Time that he takes any thing *ſharp and acid*, either by Way of Draught or otherwiſe.

The Reaſon is plain; the latter will turn the former ſowre.

Abſorbents never to be mix'd with Acids.

In *Draughts* containing *Abſorbent* or *Alkaline Powders*, we muſt never mix any thing *acid* or eager.

And yet this is frequently practiſed; without conſidering, that the Abſorbents, imbibing the Acids join'd with them in the Draught, are render'd incapable of abſorbing thoſe which they meet with in the *Primæ Viæ*.

For the ſame Reaſon, the Acids added to the Draught, having inſinuated themſelves into the Pores of the Abſorbents there, are no longer in a Condition to quiet the Ferment and Agitation of the Juices.

So that theſe Two Contraries, confounded together, cannot poſſibly anſwer the Indications, for which they are preſcribed.

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## SECOND SORT *of the Malignant-Confluent Small Pox.*

Near Affinity betwixt this Specie and the *Malignant-Diſtinct.*

THIS Second Species differs very little from the firſt Sort of the *Malignant-Diſtinct*. All the apparent Difference betwixt them conſiſts, in the greater Number of Puſtles in this Sort, and in the Violence of the Malignant or Inflammatory Fever, with which it is attended.

*Method of Cure* before the Suppuration.

Bleeding and Purging immediately.

Theſe Symptoms, together with the vitiated Quality of all the Juices, indicate Bleeding and Purging, as ſoon as poſſible; however, with the ſame Preparations, that were mentioned in the Caſe of the *Malignant-Diſtinct*. We muſt be equally careful to proportion the Evacuations to the Strength of the Patient, and the Intenſeneſs of the Diſtemper; having always an Eye to what threatens him when the Suppuration ſhall come on.

Diluting *Apozems*.

After ſufficient Evacuations, *if the Fever is very high and burning*, we muſt content our ſelves with the Uſe of *diluting Apozems*, alone, and without any Mixture of Abſorbents or other Medicines.

*If it is acute, yet not quite ſo violent*, we may add *Antim. Diaphoret.* & *Sal Stibij Solubile.*

*But if the Fever be only moderate*; if the Puſtles do not riſe and fill ſufficiently; or if it be neceſſary to promote Perſpiration, the *Sal Stibij* muſt be retrenched, and in its Room half a Grain or a Grain of *Kermes Mineral* ſubſtituted.

In

Abſorbents in caſe of a Looſeneſs.

In caſe the Looſeneſs is greater than we could wiſh, the *Ant. Diaphoret.* muſt be ſuppreſs'd, and in its ſtead the *Powders of the Confection of Hyacinth*, and of *Alkermes*, muſt be given in the *Apozems.* Or if in this manner of taking them, we ſtill apprehend their increaſing the Looſeneſs, the Patient muſt take the Powders ſeparate from the *Apozems*, and drink a Glaſs of his *Ptiſan* after them.

Symptoms reviving upon Suppuration.

In ſpight of all theſe Endeavours, 'tis very poſſible the Symptoms may return, in the time of Suppuration. 'Twill then be in vain to oppoſe them by Bleeding and Purging: For theſe Remedies are too late, they are wholly uſeleſs, and may prove fatal. *Bliſters* muſt be our laſt Reſort; and theſe are to be applied with thoſe Precautions, and in that manner which is hereafter deſcribed.

*Method of Cure* ſometimes alter'd on account of irregular Symptoms.

This is the *Method of Cure* to be obſerv'd in the Second Sort of the *Malignant Confluent*; and what I conſtantly adhered to, and found ſucceſsful, in 1716, and the Years preceeding. But this Diſtemper is ſometimes ſo fatally irregular, that to ſtop its dreadful Progreſs, we are conſtrain'd to quit the common Method, and to find out a new one.

Deſcription of the *Malignant-Confluent*, in 1719.

'Twas about the End of *Autumn*, 1719, when ſuch a Sort of the Small-Pox ſpread themſelves all over *Paris*, and made unſpeakable Havock. Whatever Means we uſed for the Relief of our unhappy Patients, the Symptoms were ſure to renew their Fury the firſt Moment of the Suppuration. And whereas, according to the ordinary Courſe, that does not begin till the fifth, or the Cloſe of the fourth Day; here it often began at the End of the third. The Violence of the Symptoms was irreſiſtible, and few were ſo happy as to eſcape; whether they were treated according to the Method we have propos'd, or in any other. We were ſeiz'd with Grief and Amazement, to ſee that all without Exception met their Doom, the fifth or ſeventh Day after the Eruption; nay ſometimes at the Beginning of the Suppuration.

The only Difference we then took notice of, was, that thoſe who had been bled and purged at the Beginning, ſeem'd more eaſy, and were leſs ſubject to Agitations for ſome time. But it was a flattering and fallacious Calm, conſtantly ſucceeded by ſomething terrible! Its fair Appearance impoſed on none, but ſuch as were not converſant with Numbers of the Sick.

The Toſſings and Agitations were leſs violent indeed, but Death was no leſs certain.

Medita-

Cauſes of their dreadful *Cataſtrophes.*

Meditating upon theſe fatal Events, which muſt needs affect in a moſt ſenſible manner, every Phyſician that has any regard to the Honour of his Profeſſion, or to Humanity itſelf; I have reſolved them into the following Cauſes.

The ſcorching Heat, and extreme Drought, which we endured without Intermiſſion, from the middle of the preceeding *Spring*, had vitiated the Blood, and deſpoil'd it of its *Serum:* As may but too eaſily happen in a Country like ours, where guarding againſt the Sun's Heat, and tempering the Blood by proper Diet, is commonly ſo little thought of.

The Genius and Obſtinacy of the other Diſeaſes, which raged at that time, ſhew'd us likewiſe, that all the Juices, particularly the *Lympha*, were to a great degree incraſſated, and depriv'd of their aqueous Vehicle, ſo neceſſary to facilitate their Circulation.

Other Obſervations upon them.

We obſerved in theſe Malignant Confluent Small-Pox, that the Spittle thrown out during the *Ptyaliſm*, was thicker and more viſcid than ordinary. The Neck, Face, Arms, and Hands of the Sick were prodigiouſly ſwell'd; and theſe Parts much firmer and harder than in common Swellings. When this Swelling was come to its height, and the Fever of Suppuration kindled, the *Saliva* grew thicker and thicker, the *Ptyaliſm* abated, and at laſt entirely ceas'd: The never failing Signal of approaching Death!

**Inferences from theſe Obſervations.**

From theſe Obſervations I concluded:

I. *That thoſe frequent dreadful Accidents*, which attended the *Malignant-Confluent* of this Year, were owing to the Incraſſation of the *Lympha*, which, being deprived of its aqueous Part, could no longer circulate, but with Difficulty and Slowneſs, in its Veſſels, eſpecially thoſe of the Head.

II. *That this Lympha* was diſpoſed to rarefy conſiderably, and to form Obſtructions; which interrupted the Circulation of the Juices, and in a few Days reduced the Patient to Extremity.

*Method of Cure* in this Sort.

As to the Remedies, fit to be uſed in the like Situation, I found that *Spirituous Cordials*, and other Medicines, which ſeem proper to attenuate a thick *Lympha*, ſerved only to excite too great a Rarefaction, and gave too violent a Motion to all the Juices. They increaſed the Fever, they brought a pernicious Tenſeneſs upon the Solids; and were ſo far from reſtoring Fluidity to the *Lympha*, that they dry'd it up the more, and frequently haſten'd on the fatal Moment.

*Aqueous and diluting Medicines*, gliding only over the thick *Lympha*, were unable to penetrate, and render it more fluid; 'twas not, therefore, in the Power of theſe to vanquiſh the Symptoms. Neither was there any more to be expected from *Coolers*, which were too weak to attenuate and diſſolve this incraſſated *Lympha*.

*Bliſtering-Plaſters.*

It was in *Bliſters*, therefore, that all our Hopes were plac'd to anſwer the Indications, which preſented themſelves. The ſmall Succeſs which this Remedy met with on ſeveral Occaſions, did not diſcourage us. We judged that this was to be imputed to a too late Application. Reaſon doth indeed perſwade, and Experience convince us, that moſt commonly *Bliſters* can only diſcharge a ſmall Quantity of ſerous Humours; that their Efficacy does not conſiſt in drawing theſe ſo much, as in their ſharp-pointed Salts; which mix with the Blood, and forcibly break and attenuate the *Lympha*, without exciting too briſk a Fermentation. They ought therefore to be apply'd at the very firſt; to prevent, if poſſible, the Obſtruction of the Glands and Veſſels. For when that is once well form'd, and come to a certain pitch, this Remedy will have no effect; even though it ſhould draw off a large Flux of ſerous Humours.

**When to be apply'd.**

By theſe Reaſons we were determin'd to uſe them, the firſt, ſecond, or third Day of the Eruption; and we never found them to give Occaſion to any new Accidents. But for fear of cauſing too great an Irritation, we always delay'd the Application of *Bliſters*, till the *Cathartick* had wholly ceas'd working. This is a neceſſary Precaution, in as much as that they are very likely to be diſplaced, by the Motions which the Patient cannot avoid giving himſelf, during the Operation of that Medicine. To hinder theſe Plaſters from affecting the Urine, we muſt order at the ſame time, for the Patient's Drink, a *Ptiſan*, made of *Marſh-Mallows*, or *Barley*.

**Not excluding *Apozems*.**

The Uſe of Bliſters ought not to exclude that of *Simple Apozems*; or even thoſe with a Mixture of *Antimonium Diaphoreticum*, the *Abſorbent Powders*, or *Sal Stibij*, as Occaſion ſhall require.

However, Care muſt be taken to keep the Belly open, in order to avoid Irritations upon the Bladder, and other Accidents; which yet are far leſs dangerous than the Symptoms we ſtrive to ſuppreſs by the Help of Bliſters.

We are to conſider, that, in the Small-Pox, Bliſtering-Plaſters cannot be made to ſtick on without ſome Difficulty; and that their Operation is more ſlow than in other Caſes, by reaſon of the Inflammation which the Puſtles cauſe upon the Skin. We muſt therefore ſee that the Plaſters are freſh made, that they be well charg'd with the *Cantharides*, and ſufficiently moiſten'd with *Vinegar*; and they muſt be fix'd upon the Part by a *Bandage*, to prevent their being diſplaced. They ought to be kept on about four and twenty Hours; and when taken off, not only the Bliſters, that are rais'd, muſt be cut, but alſo ſo much of the *Cuticula* as is parted from the Skin.

The ordinary *Dreſſing* muſt be with *Freſh-Butter* and *Beet-Leaves*.

Indication of their little Effect upon the *Lympha*.

It often happens that the Skin, where the *Epidermis* is taken off, becomes perfectly dry in a little time; which is a plain Token that Bliſtering hath had but little Effect upon the *Lympha*.

How to be ſupply'd.

To remedy this Inconvenience, inſtead of the Beet-Leaves, we muſt lay on a Plaſter made of an Ounce of *Diachylon Compoſ.* and two Scruples or a Drachm of *Cantharides*. When the Part ſhall ouze ſufficienly, the Plaſter muſt be taken off, and the forementìon'd Dreſſings uſed.

If the *Bliſtering-Plaſters* were apply'd early, and have had Time to act upon the *Lympha*; we may be aſſur'd of their full Effect, from the following Symptoms.

Symptoms ſhewing the good Effects of the Bliſters.

*The Ptyaliſm* will be more copious, and the *Saliva* thinner.

*The Puſtles*, which were ſunk and flat, will riſe and fill.

*The Parts*, that are exceſſively ſwell'd, will be leſs firm, and more yielding to the Touch.

Inconveniences ariſing from Bliſters.

Notwithſtanding the great Benefit of *Bliſters*, they are ſubject to two Inconveniences.

*The Variolous Humour* remains too clear and fluid, which hinders the Puſtles from drying ſoon enough.

*The Fever of Suppuration* is prolong'd, ſo as often to continue a conſiderable Time after the tenth Day of the Eruption.

Their Occaſion.

Theſe Accidents depending on the Diſſolution of the Juices occaſion'd by the Bliſters, ſhew in what manner thoſe Plaſters operate.

How to be prevented.

In order to prevent them, as ſoon as the Suppuration is over, *we muſt cut the Puſtles*, except thoſe upon the Face. By this means, we ſhall hinder the Variolous Humour from returning into the Blood, or keeping up the Fever. This Precaution alone is often ſufficient to take off the Fever, or at leaſt to abate it conſiderably.

But

Gentle Purges.

But if by this means it is not extinguiſh'd, the Patient muſt take ſeveral gentle Purges ſucceſſively. Theſe will carry off the Salts of the *Cantharides*, which may have got into the Veſſels. They will likewiſe evacuate the Saline Parts of the Blood and *Lympha*, which the Bliſters may have diſſolv'd in their Salutary Operation.

*Agglutinant Regimen.*

'Tis abſolutely neceſſary the Patient ſhould obſerve a very *Agglutinant Regimen*, and that he ſhould uſe a great deal of *Rice*, *Barley*, *Lentils*, &c. in his Aliment and Drinks.

By theſe ſeveral Means, the Fever often diſappears in a few Days.

But if it ſtill continues obſtinate, and yields not to this Method of Cure; we may conclude, that it is kept up and fomented by the peccant Saline Quality of the Juices. Yet even in this Caſe, we ought not to be diſcouraged. The Continuation of *gentle Purges*, of *Abſorbent Bolus's*, and the *Agglutinant Regimen*, will at laſt overcome it.

Two Remarks concerning the Method of Cure.

We ſhall conclude this Chapter, concerning the Second Species of the *Malignant-Confluent* Kind, with *Two Obſervations*.

We may, without the leaſt Hazard, apply *Bliſters* even to Women with their *Catamenia*

*tamenia* actually upon them. I have treated ſeveral in this manner, who were under theſe Circumſtances, and never found that they did amiſs, or underwent a greater Flux thro' the Application. 'Tis true, I always took care to have early recourſe to *Diluters* and *Agglutinants.*

It hath been the Practice of ſeveral Phyſicians, to make uſe of *Acid Draughts*, in this as well as the foregoing Sort. The Benefit they expected from them, was to prevent the Diſſolution of the Juices, to incraſſate the Blood, and to hinder its being exceſſively rarefy'd upon the Paroxyſms of the Fever. I think this Method is neither countenanc'd by Reaſon nor Experience; and am convinc'd (more eſpecially from the Succeſs of Bliſters, and their manner of acting) that a conſiderable Incraſſation of the *Lympha* is more to be apprehended in this Diſtemper, than a Diſſolution of the Juices. Not but that theſe are ſometimes diſſolv'd towards the Concluſion: But the primary Cauſes of this are always Obſtructions, form'd in the Lymphatic Veſſels belonging to the *Meninges*, or to the Subſtance of the *Brain.*

Beſides, I never obſerv'd *Acids* to ſucceed in this Sort of the Small Pox, except when drown'd in a large Quantity of

Liquor. It is, therefore, to *Diluters* chiefly, that the Succeſs aſcrib'd to Acid Drinks is owing.

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## THIRD SORT *of the Malignant-Confluent.*

The Symptoms of this Sort terrible.

THE Symptoms uſually attending this Third Sort, are ſo Violent and Cruel, as to allow but ſmall Hopes of Recovery; to thoſe eſpecially, who have neglected applying to a Skilful Phyſician, in the very firſt Moments of the Diſtemper.

Repeated Bleeding in the Foot or Arm.

If we are call'd in due Time, we begin with bleeding the Patient ſeveral times in the Arm or Foot; our Choice of which is regulated according to the Symptoms.

When that in the Arm preferable.

We prefer that in the *Arm*, when the Patient ſpits or vomits Blood, or when he diſcharges a great Quantity of it by way of Urine.

When that in the Foot.

On the other hand, altho' there is a great Diſcharge by the ways here mention'd, yet we have recourſe to *Bleeding in the Foot*, when the Patient likewiſe bleeds much at the Noſe; when he is tormented with violent Pains in the Head; with Convulſions, *Coma's*, *Deliria*, &c. For, on theſe Occaſions, our principal Concern muſt be to relieve the Head; the Oppreſſion of which is the moſt urgent, the moſt dreadful Symptom, that can attend this Diſtemper.

Early Uſe of Vomiting and Purging.

We muſt *Purge* as ſoon as poſſible; and even order *Emeticks*, in caſe there is not a Diſcharge of Blood by Stool or Vomiting: But we muſt take care, not to excite too violent Efforts. If we do make uſe of *Purgatives*, we muſt confine our ſelves to ſuch only as are proper to ſupport the Action of the *Emetick*.

Purgatives.

The Safeſt that we can uſe, are, *Caſſia*, *Manna*, *Tamarinds*, &c. which muſt be drown'd in a large Quantity of proper Liquor, *viz.* *Whey*, or *Chicken-Water*. Theſe muſt be order'd twice or thrice a Day; and, if there be Occaſion, continued for ſeveral Days ſucceſſively, in order to abate the Violence of the Fever.

Acid Draughts.

Immediately after the Operation of each Purge, and oftentimes during the Intervals betwixt one and another, we give the Patient *Acid Draughts* of a Decoction of *Lettice*, *Purſlane*, *Piloſella*, mix'd with Syrup of *Lemons*, or *Barberries*, the *Eſſence de Rabel*, the *Spirit* *of Sulphur*, or *Vitriol*, &c. Theſe are the Acids which we have found moſt ſucceſsful.

The Great *Sydenham* preferr'd the Spirit of Vitriol to all others. He aſſures us, that he uſed it with very good Effect, in a Sort of the Small-Pox very like this, which were riſe in *London* in the Year 1674.

Acids in the Broths and Ptiſans.

We uſe likewiſe to mix *theſe Acids in the Broths and Ptiſans*; or ſometimes only *Lemon-Juice* in the Broth. As to the *Ptiſans*, they are commonly of *Strawberry-Roots* and *Gramen Caninum*; or in their room may be ſubſtituted a light Decoction of *Piloſella*, or *Lemonade* it ſelf. If we find the Stomach cannot bear theſe Acids in the Broths and Ptiſans, we have recourſe to *Agglutinants*; ſuch as *Rice*, *Barley*, &c.

Reaſons why Acids are uſed.

No one ought to be ſurpriz'd at our uſing Acids in this Sort of the Small-Pox; for in this they are more proper than in any other. The *Craſis* of the Blood, in this Diſtemper, is very much like to that in a Sort of *Scurvy*, occaſion'd by *Acrimonious Salts*. The Diſſolution of the Juices in this Sort of the Small-Pox, is produced by the great Quantity of the diſſolv'd Salts; as is evident from the Fluidity and Blackneſs of the Blood, diſcharg'd at the Gums, Eyes, by way of Urine, or Stool; as alſo of that which is found in the Puſtles, when they are open'd. Now *Acids* are infinitely more proper to correct theſe *Acrimonious Salts*, than ſuch *Agglutinants* as *Barley* or *Rice-Cream*, which can only embarraſs them. Beſides, theſe Salts abound too much, and are too groſs; the Diſorders, which they cauſe, are too violent and rapid, to give us the leaſt Imagination that *Agglutinants* will be able to put a Stop to them. All that theſe can do, is to incraſſate the Juices: But they cannot alter the Quality of the Salts, nor ſtop the Diſſolution caus'd by them. *Acids* alone are capable of theſe Effects; as we may judge from their Virtue in *Hæmorrhages*, ariſing from a Diſſolution of the Juices. To which may be added, that we have always found the Symptoms to abate, and the Puſtles, in this Kind of the Small-Pox, which were ſunk and flat, to riſe and fill by the conſtant Uſe of Acids.

If, by the Courſe here preſcribed, we can preſerve the Patient till the End of the Suppuration, (which, God knows, but ſeldom happens) we muſt then apply our ſelves to evacuate the Acrimonious Salts, remaining in the Blood, by the Help of gentle *Cathartics*; and to ſweeten thoſe which cannot be carry'd off, we muſt order an Agglutinant Diet: And, laſtly, to compleat the Cure, we muſt have recourſe to *Antiſcorbuticks*.

This Sort ſcarce curable.

For my own Part, tho' I have judged this to be the propereſt Method of Cure in the Third Sort of the *Malignant-Confluent*, yet I muſt freely own, that hitherto the only Fruit I have receiv'd from it, has been the quieting the Symptoms in ſome Meaſure, and eaſing the Patient during the Courſe of the Diſtemper; but have never been ſo happy as to recover any one. 'Tis true, it has always been my Fortune to be call'd very late, and have then had the Mortification to find, that nothing but *Cordials* had been oppoſed to the Progreſs of this Evil. Now in *this Sort* of the *Small-Pox*, all *active Medicines*, which ſerve only to diſſolve the Salts, and to put them in Motion, are entirely contrary. The ſame Sentence is to be paſs'd upon Bliſters, and moſt of the Remedies employ'd in the other Sorts: They would be fatal in this.

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## *The* FOURTH SORT *of the Malignant-Confluent Small-Pox.*

The Fourth Sort of the Malignant-Confluent, very like the Malignant-Diſtinct.

THIS Sort is of a middle Nature between the *Malignant-Confluent* and *Malignant-Diſtinct*. But it has a ſo much nearer Affinity with the latter Sort, that they are ſcarce to be diſtinguiſhed, and their Method of Cure is the ſame. Therefore I ſhall refer to what has been laid down concerning the Cure of the *Malignant-Diſtinct*, Page 169.

## GENERAL DIRECTIONS *for All the Sorts of the Small-Pox.*

HAving treated concerning the Method of Cure in each particular Sort, I think my ſelf obliged to give ſome Directions, which ought indiſpenſably to be obſerv'd in all of them.

The Patient's Room neither too hot nor too cold.

*Our firſt Care* muſt be, to ſee that the Air in the Patient's Room is kept in a due Temper betwixt Heat and Cold, ſo that the Cold may not be ſenſible, nor the Heat exceſſive.

Not to be overloaded with Bed-cloaths.

*He muſt not be* overloaded with Bed-Cloaths. It will be ſufficient to cover him in ſuch a Manner, as to guard againſt the Impreſſions of the External Air, which might otherwiſe check that gentle Perſpiration, ſo neceſſary to be kept up in this Diſtemper.

The Air muſt have a free Paſſage.

*The Curtains of his Bed* muſt be left open enough to give a free Paſſage to the Air; that the Patient may be conſtantly refreſh'd, and not oblig'd to reſpire the noxious Steams emitted by his Breath and Perſpiration. If theſe were ſuffer'd to hover over him, they would throw him into Faintings and Languors, and even keep up and heighten his Fever.

How to prevent the *Pitting* of the Small-Pox.

The Variolous Humour often makes ſad Havock on the Skin, eſpecially that of the Face, by the Pits and Scars it leaves behind it. Phyſicians have thought of ſeveral Ways to remedy this Inconvenience.

Some have imagined it was neceſſary to dry up the Humour in order to prevent this; but that commonly dries up faſt enough of it ſelf.

I think the chief Endeavour muſt be, to mollify and ſupple that outward Pellicle which involves the Humour of each Puſtle, ſo that it may be diſpoſed to give Way and ſtretch the more eaſily. By this Means the Purulent Matter, meeting with the leſs Reſiſtance, will be forced into the Puſtles out of the Parts beneath, which want to be filled up; and thus the *Pitting* will be avoided.

On the contrary, if we do not mollify theſe External Pellicles, nor moiſten them ſufficiently, they will quickly become hard and dry; and the Variolous Humour, for want of Room in the Puſtles, will remain in the Parts beneath, and hinder them from being repair'd. The more ſoft, moiſt, and tender the Bottoms of the Puſtles are, the more eaſily are they hollow'd and corroded by the Purulent Matter; and hence come thoſe Disfigurements by the Marks and Pits of the Small-Pox.

Several *Liniments* have been contrived to prevent theſe Inconveniencies. From numerous Tryals, I have found none more effectual, than that which I ſhall here preſcribe.

## *LINIMENT.*

Take two Ounces of *the Oil of the four cold Seeds*, two Drachms of the beſt *Sperma Ceti*, and Three Drachms of *Virgin Wax*. Diſſolve the whole *in Balneo Mariæ*, and then ſtrain it: skim it afterwards with a wooden Spoon, and put it, by a very little at a Time, into a Marble-Mortar. Beat it for Three or Four Hours with a wooden Peſtle, pouring in ſome clear Spring-Water from Time to Time; and then add ſome Drops of the *Oil of Lemons*, or a few Spoonfuls of *Orange-Flower Water*. Take of this upon the End of a Feather, and anoint all the Puſtles of the Face.

You may begin to uſe this Liniment as ſoon as the greateſt Part of the Puſtles have done Suppurating, ſo as to appear all over white; which commonly happens at the End of Seven Days: However, there would be no Danger, were it uſed before the Suppuration is finiſh'd. It muſt be repeated ſeveral Times a Day; as often indeed as the Face becomes dry, to hinder (as far as poſſible) the outer Skin of the Puſtles from hardening and ſhriveling up too faſt.

The principal Affair in making up this Liniment, is to beat it a long Time, in order to incorporate well the Ingredients, and to render it very white and light.

It will keep ſeveral Days without ſpoiling, provided it be ſet in a cool Place. When it grows too thick, it muſt be beat over again, mixing now and then ſome Drops of Spring-Water with it. But when it turns yellow, and contracts a rancid Smell, it is no longer fit for Uſe, and therefore ſome freſh muſt be made.

# *CONCLUSION.*

I Have deſcribed that Method of Cure, which I eſteem the beſt and ſafeſt, in thoſe ſeveral Kinds of the Small-Pox, that have fallen under my Obſervation. Some Phyſicians perhaps, too obſtinately addicted to the Methods they have been accuſtomed to, may blame me for differing ſo much from the moſt celebrated Authors who have written on this Subject. *High and Spirituous Cordials* are preſcribed by ſome of theſe; while others admit only of *Coolers*, as *Barley-Water*, *Lemonade*, and *acid Draughts*.

Spirituous Medicines alone preſcribed by ſome, and Coolers by other Authors.

To underſtand theſe, the Nature of their Climate, and of the Small-Pox in their Time, to be conſider'd.

I ſhall always have a great Deference to the Sentiments of theſe Learned Authors; but not in ſo ſervile a Manner as to neglect the Examination of the Reaſons on which they are founded. Theſe are deduced, either from the Climate where they lived, or from the Cauſes and Symptoms of the Small-Pox which raged in their Time. For want of a due Regard to theſe Diſtinctions, to what Errors do we expoſe our ſelves, through Prejudice and a blind Submiſſion to Authority? Doth not every Days Experience convince us, that the ſame Remedy applied to the ſame Diſeaſe may be ſucceſsful in ſome Conſtitutions, and fatal in others? This deſerves to be inſiſted on more at large in our preſent Subject.

Food and Temperament of *Northern* Countries.

*In the Northern Parts* of the World, where the Air is groſs, and the Regions cold and marſhy, where the Inhabitants live much on Milk, and are uſed to an unctious inſipid Diet, ſlenderly furniſhed with Saline Particles, their Blood muſt needs want its due Quantity of Salts, and be viſcid and indigeſted. Its Parts are too much intangled with each other, and want the juſt Degree of inteſtine Motion. It will be, therefore, neceſſary to give them this Motion, by dividing and attenuating the heavy viſcid *Lympha*, and reſtoring Perſpiration, which is almoſt, if not quite deſtroy'd. *Spirituous Medicines* produce theſe Effects, and are the more ſafe, in that there is no Reaſon to apprehend their inflaming that Blood, whoſe Texture is ſuch as we have deſcribed. Whence we are to conclude, that the Phyſicians of thoſe Countries, have on very juſt Grounds made choice of, and recommended High Spirituous Cordials.

Why High Cordials there, convenient in the Small-Pox.

Quality of the Air and Diet in *Southern* Climes.

On the contrary, in *Southern Climates*, the Air is much more brisk and warm; the Pores of the Body more open, and the Diet more light, and better ſtock'd with Salts. So that the Blood is more ſaline, more ſubtle pure and thin, and apter to inflame. Here then, *Cooling Acid Medicines* are moſt proper to quiet its too violent Motion, unite its too divided Particles, and to abate the too great Diſcharge by way of Perſpiration. Volatile Spirituous Medicines, far from mode-

Acids and Coolers uſeful here.

The Effect of Spirituous Medicines.

moderating this Agitation of the Juices, will ſerve only to throw them into a total Diſſolution. And this fully juſtifies the Writers and practiſing Phyſicians of theſe Countries, in wholly rejecting them, and making the contrary Choice of *Coolers*.

Bleeding, Vomiting and Purging to be uſed in every Climate.

But under whatever *Climate* we live, whatever uſe we make of theſe oppoſite Remedies, yet 'tis rarely in ther Power alone to effect a perfect Cure. Bleeding, Vomiting, and Purging, will always deſerve the greateſt Streſs to be laid upon them, in the Cure of the *Malignant Small-Pox*.

Bleeding ſparingly in cold Countries.

*In cold Countries*, Bleeding muſt be ſparingly uſed, and never but when indicated by urgent Symptoms.

Vomiting and Purging to be early uſed.

But Vomiting and Purging are indiſpenſably neceſſary at the Beginning of the Diſtemper. Theſe diſcharge the Blood from thoſe groſs Humours which deaden the Motion of the Fluids; which hinder the Solution of their fineſt Parts, and their Paſſage into the Glands; and will not ſuffer the Puſtles to riſe and fill.

When to be ſupported by high Cordials.

If theſe Remedies are too ſlow in producing their Effect, they may be ſupported by active Cordials. But 'tis but ſeldom that theſe are requiſite. Vomiting and Purging alone are commonly ſufficient to cauſe an eaſy Eruption, and conſequently to work a ſpeedy Cure.

Different Practice in hot Countries.

On the other Hand, *in warm Climates*, *Cathartichs* require a very diſcrete Management. But Bleeding muſt be copious and frequent. There is ſcarce any Occaſion to recommend that in the Foot, in places where they but ſeldom bleed in the Arm. The chief Symptoms of Diſeaſes there almoſt conſtantly ariſe from Oppreſſions upon the Veſſels of the Head. So that from long Experience they have been taught, that, in order to relieve theſe Veſſels, and to prevent and avert an Inflammation, no Remedy is ſo efficacious as Bleeding in the Foot.

The Practice at *Paris.*

Come we now to the Method which ought to be obſerved at *Paris*, in the Cure of the Small Pox. The Air which we breath is thick; we are uſed to a plentiful Diet, long and frequent Meals; to ſucculent Food, various Ragous, Salt-Meats, Spices, Plenty of Wines and ſtrong Liquors; and moreover, to a ſedentary unactive Life, eſpecially among People in eaſy Circumſtances.

What are we to expect from ſuch a way of Living? An abundance of groſs Blood replete with Salts, and conſequently apt to take fire, that is, to rarefy and expand. Do not theſe vicious Diſpoſitions naturally lead us to frequent and plentiful Bleeding?

Again, the Groſſneſs of our Air, the Indolence and Inactivity of the greateſt Part of our Inhabitants, deaden and benum (as it were) the Juices contain'd in the Blood. Theſe are not broken and attenuated but with Difficulty; the Perſpiration, and other Secretions, are imperfect; the *Lympha* remains overcharg'd with indigeſted Humours; and the Glands are choak'd up and infarcted with them. In this State, what Remedies, beſides *Emeticks* and *Cathartícks*, will be able to thin and diſſolve theſe incraſſated Juices; to free the Glands from Obſtructions; and to diſcharge the Humours through the *Primæ Viæ*?

And laſtly, the vicious Diſpoſition of the Blood, which at the ſame time is both too groſs and too ſaline, ought commonly to exclude, not only the high Cordials, that are ſucceſsfully uſed in colder Regions, but alſo the Refrigerant Medicines which leave ſo good Effects in the warmer. The former would put the Fluids into too briſk an Agitation, and would cauſe too violent a Tenſity in the Solids. The latter would deaden the Motion of the ſaid Fluids, and give their Particles too great an Opportunity to unite and coagulate. It muſt nevertheleſs be acknowledg'd, knowledg'd, that there are Occaſions wherein ſometimes Spirituous, ſometimes cooling Medicines may be employ'd to great Advantage. But I ſhall not here ſtate theſe Exceptions, which are but rare; it will be ſufficient to refer to what hath been ſaid already concerning the particular Caſes, wherein they take place.

Theſe Obſervations have induced me to endeavour at a juſt Medium, betwixt the contrary Extremes. The Neceſſity of diluting an incraſſated Blood, and of making it circulate more freely; the Fear of inflaming it when too replete with Salts, hath made me have recourſe (after *Emeticks* and *Cathartick*s) to cooling Medicines, ſuch as *Apozems* are made up of. They dilute and thin the Blood, and diſſolve the *Salts* contain'd in the Juices. Theſe, when once diſengaged from the viſcid *Serum* that entangled them, penetrate and incide the *Sulphurs*, which cohere too tenaciouſly. So that they produce the ſame Effect with ſpirituous Medicines, but in a more gentle and leſs dangerous manner: And by this Means the Juices acquire that Thinneſs and Fluidity, which is requiſite to their filtrating eaſily through their ſeveral Strainers.

It is alſo neceſſary to diſengage and open the Pores of the Skin, which are

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